The Garden Journal

of The New York Botanical Garden

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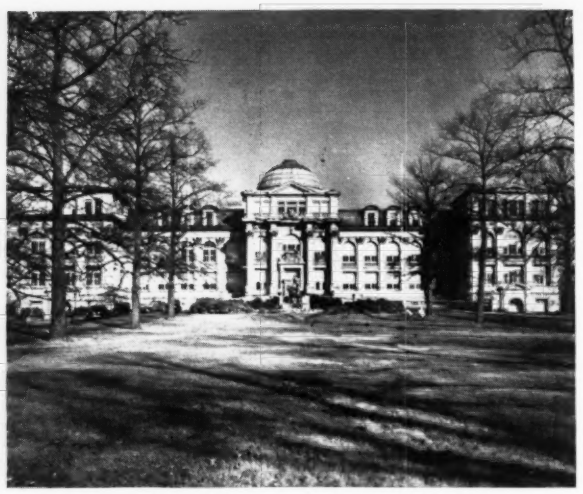

Exhibit, **"Romance of Tea,"** continues in the Museum Building until November 1.

The Tenth Annual Chrysanthemum Show, in cooperation with the Westchester and Long Island Chapters of the National Chrysanthemum Society, will be held in the Conservatory of The New York Botanical Garden October 22, 23, 24.

THE GARDEN JOURNAL
of The New York Botanical Garden

DOROTHY EBEL HANSELL
Editor

CONTENTS
July-August, 1954

AMERICAN WITCH HAZEL
PART I — History, Nomenclature and Early Uses; PART II — Industry *Edmund H. Fulling* 97
A VISIT TO PORTUGAL, ITALY AND FRANCE *Helen M. Fox* 101
METTLER'S WOODS *Gily E. Bard* 105
MY HOBBY IS KEEPING ORCHIDS HEALTHY *Ernest N. Cory* 108
THIRTEEN SMALL TO MEDIUM-SIZED TREES *Clarence E. Lewis* 109
DAYLILIES ARE IRRESISTIBLE *Isabelle B. Henderson* 111
GARDEN STRUCTURES AND ACCESSORIES *George B. Tobey, Jr.* 113
Photography by Cliff Arthur
ROYAL BOTANICAL GARDENS *Leslie Laking* 114
WILD FLOWERS IN THE NEW YORK BOTANICAL GARDEN — Part V *Joseph Monachino* 117
JOHN JEFFREY — PLANT PILGRIM OF THE NORTHWEST *Grace T. Dowling* 118
PETALS TO PISTILS
PART I — PETALS *Elise Ludlam Bowles* 120
BOOK REVIEWS 123
NEWS, NOTES AND COMMENTS 127
LET THERE BE HERBS *Gertrude B. Foster* 132

CREDIT FOR ILLUSTRATIONS

Front cover, colored illustration of the restored Lorillard Snuff Mill, by E. N. Mitchell; p. 99, The New York Botanical Garden; p. 101, Estacas Agronomica Nacional, Sacavem; pp. 102, 103, Jardin Botanique, Coimbra; p. 105, John Wolbarst; p. 106, F. J. Higgins; p. 107, first column, top second column, Rutgers University; p. 107, lower right, F. J. Higgins; pp. 109, 110, Clarence E. Lewis; p. 111, Jim Gernigan's Studio; p. 112, Lewis P. Watson; pp. 114, 115, Powell Photo and Camera Shop — courtesy Royal Botanical Gardens pp. 120, 121, Pen and ink sketches by Elise Ludlam Bowles; p. 122, Lewis P. Watson; p. 127, upper right, Light Photo Service, others, E. N. Mitchell; p. 128, upper, Mrs. Paul Sturtevant, lower, Adrian Boutrelle, courtesy Mrs. Edwin De T. Bechtel; pp. 129, 130, E. N. Mitchell; p. 131, Germains, California.

AMONG OUR CONTRIBUTORS

Probably most of the readers of The Garden Journal are familiar with *Hamamelis virginiana* and have, at one time or another, made use of the long-time household remedy, witch-hazel. On the other hand, probably very few of our readers have studied this American shrub as carefully as has DR. EDMUND H. FULLING, Editor of "Economic Botany," so we are delighted to present the history, nomenclature, and early uses of witch hazel and also witch hazel as an industry, an abbreviated form of Dr. Fulling's comprehensive article on American witch hazel in the October-December 1953, volume 7, number 4, issue of his publication, "Economic Botany." . . . Dr. William J. Robbins Director of The New York Botanical Garden, gave HELEN M. (MRS. MORTIMER J.) FOX letters of introduction to the directors of botanical institutions in Portugal, Italy, and France. Mrs. Fox reported that they treated her "like a visiting potentate." She also found "The New York Botanical Garden highly regarded. Everyone I met seemed to think we must be floating on money and have every advantage for our work, but I told them we, too, have our financial and administrative problems." Mrs. Fox's interesting report of the botanical and horticultural part of her recent trip appears in this issue of The Garden Journal. . . . DR. GILY E. (MRS. SELDON R.) BARD is a Research Associate in the Department of Botany, Columbia University. The work she did as a student under Professor Murray F. Buell in the Department of Botany at Rutgers University included a comparison of abandoned fields undergoing revegetation with a mature forest, Mettler's Woods. . . . DR. ERNEST N. CORY is State Entomologist of Maryland. . . . CLARENCE E. LEWIS is Senior Instructor in the School of Horticulture, Long Island Agricultural & Technical Institute, with which Institute he has been associated for seventeen years. He also has been lecturer in plant ecology at New York University for eleven years and has written many articles for the garden pages of The New York Times and New York Herald Tribune and other publications and conducts regularly a column in "The American Nurseryman." His recommendations for "Thirteen Small to Medium-Sized Trees" are based on an article in the latter publication. . . . Daylilies have been an absorbing interest in recent years with ISABELLE BOWEN HENDERSON, yet they have not prevented her from growing iris and other perennials. Mrs. Henderson leads a full life, for she hustles back and forth between her gardens in Raleigh, N. C., and in Tallahassee, Florida, is active in the Hemerocallis Society, and contributes to its Yearbook and somehow manages to pursue her art. Mrs. Henderson is in demand as a portrait painter. . . . GEORGE B. TOBEY, JR., is a member of the faculty of the School of Architecture and Landscape Architecture at Ohio State University. . . . LESLIE LAKING was appointed Director of the Royal Botanical Gardens this year, having been Assistant Director and Horticulturist since 1946. After being graduated in 1939 from the Ontario Agricultural College, he continued his horticultural training for two years at the Royal Botanic Gardens, Kew, England. He began post-graduate studies in botany at the University of Toronto, but they were interrupted by his tour of duty with the R.C.A.F. as meteorologist. . . . JOSEPH MONACHINO is Associate Curator of the Herbarium of The New York Botanical Garden. . . . GRACE T. (MRS. JOHN THOMAS) DOWLING is on the editorial board of the Bulletin of the University of Washington Arboretum, her special duties being the "Notebook" and "List of Plant Names." Mrs. Dowling's prime interest is in horticulture — she conducts classes in gardening for beginners and writes now and then for garden publications — but at present she is devoting her time to research in botanical matters. . . . Four years spent in studying botany at Barnard College and four months as a farmerette furnished background and practical experience to ELISE LUDLAM (MRS. C. R.) BOWLES, which have proved valuable to her in running her lovely home garden in Bronxville, N. Y., and in writing articles both for adults and children on botanical and horticultural topics. . . . GERTRUDE B. FOSTER is Editor of "Herb Grower Magazine."

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AMERICAN WITCH HAZEL

Part I — History, Nomenclature and Early Uses

By **Edmund H. Fulling**

Of all the household remedies for aching muscles, sore eyes, and irritated skin that filled at least some American medicine cabinets a generation or two ago, no other, perhaps, has more successfully withstood the replacing competition of modern medicines than has aqueous witch hazel. Appraisals of its therapeutic value differ in the extreme, but hundreds of thousands of gallons of it are still manufactured in very modern apparatus and sold annually. After more than a century of use, witch hazel water, as a result of modern methods of distilling and merchandising, is probably not lacking from the stock of any drug store in the United States, and considerable quantities are exported, principally to Europe, Latin America, and South Africa. It is the most widely used and consequently the best known of nine or more commercial products manufactured from an American shrub (*Hamamelis virginiana*), the names of which, both common and scientific, have long been applied to these products. . . .

The name "witch hazel" is centuries old, occurring in English literature in connection with at least half a dozen kinds of plants and in a variety of spellings.

In the days of English archery the craftsman who made bows was known as a "bowyer," and yew wood was preferred for his trade, but an English law of 1541-1542 (Act 33, Henry VIII, c. 9, § 3) stated:

> "That everie bowyer . . . for every bowe that he maketh of Ewe, make fower (fewer) other bowes. . . . of Elme, wyche hasille, ashe, or other Wood."

The Anglo-Saxons had coined the name "haesel." The "witch" in the name, on the other hand, has been the recipient of considerable etymological speculation, and two interpretations have been proposed.

One of them associates the word with magic powers of divination attributed in the Middle Ages to the branches of wych elm in locating witches and underground streams as well as deposits of precious metals. As late as the seventeenth century such divining rods, the "baguette divinatoire," were the subject of an elaborate treatise, and at the close of the eighteenth century the miners of Cornwall, where the superstition had taken deep root, scarcely ever sank a shaft except by direction of a wych hazel bough.

The other interpretation, that of the philologists, is supported by no less an authority than the monumental thirteen-volume Oxford English Dictionary. They trace the word through several orthographic forms to the Anglo-Saxon, or Old English, "wice" and "wic," which apparently came from the Teutonic "wik," meaning "to bend." In this sense, the philologists claim, the word in its original form was applied generally or vaguely to any woody plant noted for its pliant branches. Of all the plants to which it might thus have been applied, it apparently adhered most persistently to the elm because of the latter's importance as a secondary source of bow wood.

A combination of the two foregoing interpretations explains the "witch" more satisfactorily, in the present writer's opinion, than either of them alone, for it appears quite reasonable to believe that the flexibility of certain woody plants impressed the early inhabitants of England before they associated any magical powers with them; that they therefore applied their word indicating pliability to these plants; that they later attributed diving powers to the elm; that corruption of their "bending" words ("wice" and "wic") into "witch" resulted from the similarity between the words; and that if, instead of their "bending" words, some entirely different word had been first applied, the word "witch" would not have evolved in connection with the trees to which it became applied.

Turning now to the New World, we find one of the many orthographical variations in an account of the year 1590, seventeen years before the founding of Jamestown, the first permanent English colony, in 1607. This account enumerates the animals, plants, and other noteworthy features in the vast territory then known as "Virginia," and contains the brief statement:

> "Maple, and also Wich-hazle, whereof the inhabitants use to make their bowes."

It is impossible to determine whether this use of the name referred to the true American witch hazel (*Hamamelis virginiana*), the branches of which may have been used by the Indians as bows, or to the American elm, possibly also used in that manner and resembling the elm of England, with which the writer of that early account presumably was familiar and which, as we have already noted, was a secondary source of bow wood in the Old World. The question is all the more confounding, because there is mention also of "elme" on the same page.

Nearly two hundreds years later a certain military man, given to recording his extensive observations but not versed in plant lore, used our present-day spelling and stated that:

> "Witch hazel . . . is covered early in May with numerous white blossoms. When this shrub is in bloom, the Indians esteem it a further indication that the frost is entirely gone, and that they might sow their corn."

Since the blossoms of the American witch hazel are yellow, and open in autumn, it is impossible to determine where this author's error lay.

The preceding two instances sug-

gest that in the American colonies, too, the name may have been used, at least at first, in connection with any woody plant having supple branches. Later, however, it was limited to the true American witch hazel, the earliest record of which, so far as the present writer has been able to find, is a brief note of equivalency between the name "witch hazel'" and the generic name "*Hamamelis*" in 1760; that was eighteen years after Linnaeus, as will later be noted, established the genus and seven years after he published the specific name "*virginiana*." It is reasonable to presume that such association long antedated the record of 1760, but why the name, especially the "witch" part of it, became attached to the American shrub, so utterly different from the witch hazel, or wych elm, of England in habit and fruit, though not so much in foliage, is not easy to answer. Two or three solutions have been proposed.

One of them has it that "hazel" was applied because of a similarity in foliage, general habit, and young fruits between the American shrub and the hazel *(Corylus)* of England, and that the witch-like divining qualities which at that time were associated with the European hazel, as with the wych elm, were attributed in the minds of the colonists to the new-found shrub because of the similarity in other respects. Another interpretation says that the early American settlers saw something in the foliage or habit of the American shrub suggestive of the English witch hazel, and that "they transferred the old English name to the newly-discovered American shrub, being influenced probably by the same love for the home-words which prompted them to call the red-breasted American thrush a robin and the marsh marigold a cowslip." The point is that the difference between these two birds, and two plants, is as great as between the American and English witch hazel, but that the similarities which do exist were sufficient to impress those who transferred the names. A third explanation suggests that use of the twigs in locating underground water and deposits of metals came first (from the Indians or English charlatans?), and that the application of the old English name resulted. The reader may take his choice.

In 1742 Linnaeus established the genus *Hamamelis* on the basis of the American shrub and by appropriating therefore a Greek botanical name, which at the time was already two thousand years old. Hippocrates had used the name four centuries before Christ in connection with the medlar *(Mespilus germanica)*, an apple-like tree of southeastern Europe and other parts of the Old World. The name is composed of two Greek roots, *hama*, meaning "at the same time" or "together," and *melon*, meaning "fruit," or "apple." The combination was applied to the medlar, because it blossoms at the same time as the apple in Greece. It is very apparent that Linnaeus, who was especially concerned with flowers as a basis for classification, was impressed by the fact that in his new American shrub the blossoms appeared along with mature fruits of the previous season and that he therefore selected the ancient Greek name for a very appropriate application. In 1753 Linnaeus proposed the presently recognized specific name, *Hamamelis virginiana*, the species part of which has at times been spelled "*virginica*."

American witch hazel is a shrub attaining heights up to twenty-five feet, or tree-like stature up to thirty-five feet, and is native to North America from New Brunswick and Nova Scotia in eastern Canada westward to southeastern Minnesota, eastern Iowa, and eastern Texas, and south to northern Florida, central Mississippi, and northern Louisiana. In the Appalachians it ascends to 4,000 feet elevation.

In addition to its very characteristic wavy-margined leaves, two features are equally distinctive but not so readily observed. One is that the blossoms, consisting of four narrow, strap-shaped, twisted, yellowish petals, appear from October to December in the northern woods, not only after the witch hazel has shed its leaves but also at a season when nearly all deciduous trees and shrubs of the area are destitute of foliage and dormant. Witch hazel is thus the last of our native plants to flower in the calendar year, at least in the northern woods, and may at times be found in bloom as late as the Christmas season. In the southern parts of its range, the shrub may flower from January to March.

The second feature is that at the time of flowering every year, the fruits of the previous year attain maturity and burst open, at times with sufficient force to eject their two seeds to distances which have been measured up to over thirty feet. In most cases the dispersal very likely falls far short of this dissemination, attained only under ideal conditions that develop the necessary tension within the drying fruit.

According to some American medical botanies of the nineteenth century and later works, probably based on those earlier writings, the American aborigines boiled the stems of witch hazel and used the resultant liquid, known to some of them as "magic water," as a relief for piles, hemorrhages, bruises, cuts, scratches and other injuries; they made poultices of it for painful swellings, tumors, and external inflammations; and sore eyes were also treated. On the basis of records it may be concluded that liniment use of witch hazel decoction was originally widespread among the Indians of New York and adjacent areas but was not in vogue in the North Central States until contact between the tribes had been established by virtue of their becoming neighbors on an Indian reservation. In addition, the black seeds of witch hazel, known to the Menominee as "mêgise," were used by them as sacred beads in their medicine ceremony.

The Indian uses of witch hazel may have been taken over in isolated areas by the white settlers of the eighteenth century, and they very likely were to a greater degree in the early nineteenth century. Recognition by the embryonic American medical profession, however, was not so rapid, and this may indicate that use by the Indians was not impressive. The first medical school in what was later to become the United States was established at the University of Pennsylvania in 1765, and in 1768, Adam Kuhn, a pupil of Linnaeus, was there appointed the first professor of materia medica and botany in the United States. At that date, it appears, witch hazel had not yet been accorded medical recognition by the physicians of the time, for it was not mentioned in a work of 1798, directed particularly toward formulating a materia medica of the United States, or in others of several years thereafter.

The earliest medical mention of

Witch hazel shrubs in autumn, denuded of foliage but in flower, on the grounds of The New York Botanical Garden

witch hazel which the writer has found is in a book of home remedies published in 1816. . . . Herbalists of the time, however, must have been promoting use of the shrub, for twelve years later Rafinesque referred to it as a "sedative, astringent, tonic, discutient," adding that the Indians greatly valued it. . . .

In a medical botany of 1833, those who read such erudite works at the time were informed that:

> "The bark and leaves are slightly bitter and very astringent. The leaves are a most valuable article of medicine, as an astringent tonic and styptic.

A few years later, in 1847, a medical student was informed that the bark was

> "applied to painful tumors and external inflammations, chronic ophthalmia, etc., in the form of a decoction or cataplasm. A tea of the leaves is used as an astringent in bowel infections, and haemorrhages."

An authority of 1884 stated that, while the U. S. Pharmacopoeia directed that leaves collected in autumn alone be used, he believed this to be a mistake, because in his personal experience the bark of young branches was more efficient. He mentions its use for internal bleeding and "topically in hemorrhoids and varicose veins, bruises, sprains, etc."

In addition to the preceding, medicinal mention of witch hazel is to be found in a few other nineteenth century American publications, as well as a few of European authorship.

The other nineteenth century uses of witch hazel were utilization of the twigs as divining rods, and possibly consumption of the seeds as food.

If we believe that the American aborigines employed the twigs of *Hamamelis,* as already suggested, to locate subterranean water and mineral deposits, we have one basis for the origin of the common name. If, on the other hand, we prefer to think that the English settlers imputed the virtues of wych elm along with bestowal of the designation "witch hazel" to the American shrub, it follows that the Indians may have learned the trick from the white man. Whichever way it went, the twigs were so used in the eighteenth and nineteenth centuries by both red and white adepts in the occult arts, and some of them very likely profited handsomely by selling their services to the credulous.

Use of witch hazel as a source of food is less well established. One writer of 1846 referred to the seeds as being oily and edible, and another, in 1875, stated that they were actually used as food, but Asa Gray doubted these reports. More recently it was reported that the Iroquois of Canada use a decoction of the leaves, sweetened with maple sugar, as a tea with their meals.

PART II

Witch Hazel as an Industry

According to one account, in the early 1840's Theron T. Pond of Utica, New York, found the Oneida Indians in the neighboring territory used a "tea," made by their medicine man by boiling witch hazel in an iron kettle, for treating burns, boils, and all kinds of wounds. Impressed by their faith in the efficacy of their "tea," Pond formed a sort of partnership with the Indians to produce the material commercially, and in 1848, under the impressive name "Golden Treasure," the extract was marketed. Manufacture was continued after Pond's death, but the name was changed to "Pond's Extract," and as such it was sold for many years thereafter. After changes in management during those years, manufacturing operations were moved to Chester, Conn., about 1875, and there began present-day steam distillation of the preparation; the business was conducted in New York City.

From another account we learn that Charles Hawes, an early nineteenth century missionary in New England, was versed in the chemistry of that day and by various experiments claimed to have demonstrated the medicinal qualities of witch hazel extract. He

thereupon began manufacturing and distributing the material in his neighborhood.

Next in the story was Dr. Elmer Whittemore of New London, Conn., who left that city and opened a drug store in Essex, Conn., adding witch hazel extract as "Hawe's Extract" to his stock, but later changing the name to "Golden Treasure," most likely because the preparation under that earlier name had already acquired recognition and favorable repute. Trade names apparently were not yet copyrighted. Dr. Whittemore presumably prepared the extract himself, at least at first, but he soon approached Thomas N. Dickinson, Sr., of Essex, to assist him in the new industry. That was in 1866, or thereabout, the year in which the witch hazel industry is regarded as having been established on a commercial basis. Mr. Dickinson had been a successful manufacturer of Civil War uniforms and at the time of his becoming associated with Whittemore was a retired Baptist minister. This association lasted several years, and during it the Reverend conceived the idea of distilling and distributing the distillate to the public, not merely as an enterprise of individual druggists who might manufacture it themselves, but in bulk through the medium of the drug trade. In the early 1870's, accordingly, he began brewing and distributing the extract himself in Essex, and thereby began an association of a family name with a particular plant product through four generations to the present, almost to the exclusion of other names. With headquarters in Essex, he operated branches and distilleries in Middlesex, New London, New Haven, and Hartford Counties.

Associated with the Reverend in his independent enterprise were two sons who, subsequent to the father's death in 1900, in turn went into the manufacture of aqueous witch hazel independently, one in Mystic, the other in Essex, Conn. From 1888 to the time of his death in 1938, the Mystic son, Thomas N. Dickinson, Jr., operated eight witch hazel distilling plants in various localities in Connecticut, distilling also oil of birch. One of the plants was in Ledyard, and "Ledyard Witch Hazel" is still being marketed by the T. N. Dickinson Co. of Mystic which this year [1953], under the presidency of T. L. Dickinson, son of "T. N., Jr.," is celebrating its sixty-fifth year. The son who set up business in Essex is today represented by his grandson, E. E. Dickinson, III, who directs the E. E. Dickinson Company in Essex and who thus represents the fourth generation in the Dickinson family to manufacture and market this product. The Essex factory today is an impressively modern institution, consisting of four principal buildings for distilling, storage, machine shop, and packaging operations, respectively. Ten or a dozen stills occupy the first of these, and the huge storage facilities of glass-lined tanks, each holding tens of thousands of gallons, is strikingly indicative of the demand which still exists for an old American household remedy. Equally as impressive of this volume are the facilities for retail bottling and for bulk distribution in paraffin-lined oak barrels.

Of the twelve companies listed today under "witch hazel" in three directories of manufacturers, only these three (the Essex, East Hampton, and Long Hill) are actual manufacturers of the product from the raw material, and inquiry by correspondence has not revealed any not listed in those directories.

Witch hazel bushes are cultivated only for ornamental purposes. All material gathered for industrial utilization is collected from wild plants in two rather restricted areas when compared with the entire natural range of distribution.

One of those areas covers Connecticut and at times adjacent parts of Massachusetts and Rhode Island, furnishing material that is used only in the manufacture of aqueous witch hazel. In autumn, after their leaves have fallen and their flowers have begun to appear, the bushes are cut nearly to the ground in various parts of this region, either by the owners of the land on which they are growing or by agents of the witch hazel companies who have previously contracted with the owners at agreed prices for the right to do so. The smaller twigs are the more valuable, and stems over two inches in diameter are not acceptable, because the extractable components are only in the bark and at that size the percentage of valueless wood is so great as to render extraction unprofitable. During the history of the industry and according as has been most practical in view of distances, vehicular equipment, and other factors, the cut bushes have been brought to the factories by the land owners, or by them to collecting points where company agents have called for them, or have been brought in by the agents of the companies who have done the cutting. Before the cut bushes can be used they must be chopped by machinery into pieces up to three inches in length, and in years gone by, when modern highways did not provide accessibility to the woods, this chopping was often performed at the collecting sites by portable machinery, thus reducing the bulkiness of brush to be hauled from the woods. Today, modern facilities render it more profitable to carry out the chopping operations at the factories. Collecting activities continue several months in autumn, sometimes well into the winter and spring, but the chopping is performed only as the brush, stored outdoors at the factories, is consumed. The cut bushes readily regenerate, and in five to ten years, areas may be re-harvested.

The other collecting area is in the mountainous regions of the southern Appalachians in Virginia, West Virginia, North Carolina, Tennessee, and Kentucky. Here the bushes are not cut down, but fresh leaves are plucked from them and bark stripped from the branches for manufacture into pharmaceutical and cosmetic products.

The gathering of leaves is performed for the most part in summer and the early fall months as their sought-for tannin content increases, but some collecting is reported to begin in spring. The leaves are then dried by exposure to air, preferably in shade so that their green color will be retained. These operations are carried on by native gatherers in the mountains who then bring the dried material to dealers for inspection, purchase, baling in burlap bags, and storage in warehouses to await disposition to utilizing industries. Some of this harvest goes into American use, but most of it is exported to Europe to be used very likely in similar ways and also as a bouquet in certain French wines.

Bark is collected in all seasons. The major portion of it, however, is peeled from standing bushes in warmer

weather of spring and summer, when the sap is up and the bark consequently peels easily. In colder months, when peeling is not so easy, it is cut from freshly harvested branches, and the remaining refuse used as fuel.

In the aqueous witch hazel industry, as developed in Connecticut, the collectors of brush sell directly to the distilling plants; there are not any middlemen dealers. In the Appalachian trade in leaves and bark, on the other hand, there are intermediaries between collectors and ultimate utilizers, and their trade is considerable, for, as "botanical supply houses," they deal in a great variety of raw plant material needed by the cosmetic and pharmaceutical industries.

Nine products of cosmetic or pharmaceutical value are today manufactured from the twigs, leaves, or bark of witch hazel collected in New England or farther south in the Appalachian mountainous regions. Four of the products, in the terminology of the U. S. Pharmacopoeia, the National Formulary, and the U. S. Dispensatory are "Hamamelis Leaf," "Hamamelis Leaf Fluidextract," "Hamamelis Bark," and "Hamamelis Water"— the last is simply and most commonly known as witch hazel. These four products are the only ones listed in the latest trade directories; the others are powdered extract of Hamamelis, semisolid extract of Hamamelis, Hamamelis solution, tincture of Hamamelis, and Hamamelin. Aqueous witch hazel is the most widely known and extensively used of them; the others are prepared in relatively small amounts and are utilized only by compounding manufacturers.

Despite derogatory appraisal by the U. S. Dispensatory, which implies that it is no more than an "alcoholic rub," there is little reason to expect dimunition of consumption of witch-hazel any more than the tobacco industry has suffered from the evils associated with smoking. Certainly nothing of ill repute as is associated with nicotine can be said of "witch hazel," and the well-established traditional use of so innocuous a substance as this extract does not readily give way before the factual discrediting evidence of science, however valid that evidence may be.

Foot-note — *Details of manufacture and production statistics concerning aqueous witch hazel are contained in the original of this article.*

A Visit to . . .

PORTUGAL, ITALY *and* FRANCE

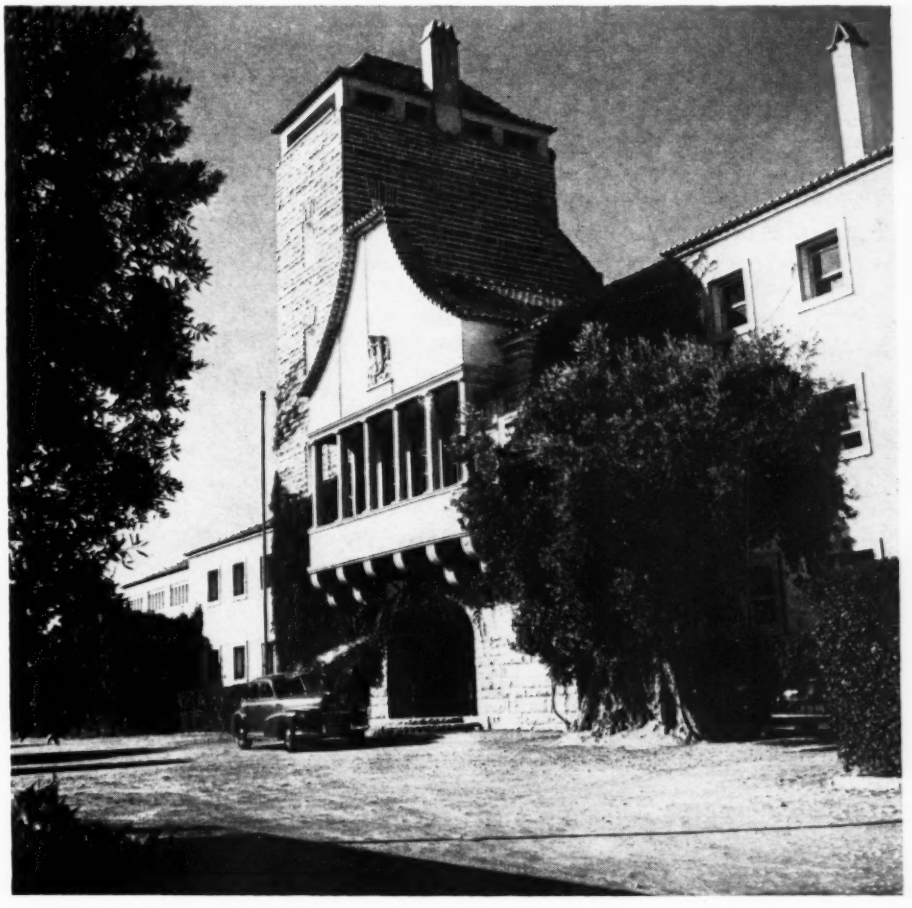
By **Helen M. Fox**

THE scientists in the various botanical gardens to which Dr. William J. Robbins so kindly gave me introductions, were all exceedingly friendly, partly because I came from such a famous institution and partly because they want to exchange ideas, plants, and dried specimens.

The overall impression of my visit was of a concentrated dedication to their work on the part of the scientists, both men and women. Recently they have had to carry on under every imaginable difficulty, but they have gone on with projects started centuries ago, often at considerable sacrifice, because they believe in their work. Also I found, though sometimes the buildings were old, the tools were modern.

All groups everywhere are particularly interested in their own flora, and members of the institutes go plant hunting in their mountains or valleys on their vacations. Practically all the botanical gardens are attached to universities and under the direction and in close cooperation with the faculty of medicine, for they almost all began as a means of teaching future doctors about medicinal plants. Consequently, there is a particularly keen interest in herbs.

During my trip I was told there are many different small bulbs and wild herbs on Monte Pellegrino at Assisi and in Calabria and also on the Island of Santa Maria in the Azores, and that in the south of Portugal there are at least twenty different kinds of thyme



Estacas Agronomica Nacional, Sacavem, Portugal

not yet introduced into cultivation.

At Lisbon, my first stop, I was taken in hand by Prof. and Mrs. Antonio R. Pinto da Silva. They both work at Sacavem, which is the government station for the study of plants. There is a handsome three-story herbarium, built around a hollow square, and a fine library particularly rich in works on the plants in Portuguese colonies. Studies are in progress on the diseases of coffee and tobacco.

Dr. da Silva is a graduate of the Botanical Institute of the University of Coimbra, and he studied under Dr. J. Braun-Blanquet at the Station Internationale de Geòbotanique at Montpellier. Mrs. da Silva is curator and librarian at Sacavem.

The botanical garden in Lisbon is famous for its tropical plants, but right now it is not as active as it has been in the past. I was taken to Sintra to a garden called "Pena," formerly a royal property, where Dr. José Roque de Pinho is the director. It is situated on a hill which rises suddenly from the coast and catches all the mists and dampness from the sea. I saw superb camellias there, as tall as some of our dogwoods and even higher, also tree ferns, palms, azaleas, rhododendrons, and many rarities.

Another garden called "Montserrat," which formerly belonged to an Englishman, Mr. Cook, is now government property. It, too, has fine plants, and they are well arranged. The Portuguese like to plant up and feature their natural gulleys, and in this garden there is a view through such a declivity. I also went to "Queluz," near Lisbon, an exquisite eighteenth-century, pale pink palace with white window frames. It is all on one floor, and the wings enclose a formal garden having many parterres outlined in box and also a long tile-lined canal.

While staying at Estoril, I spent a day at the Cabo da Roca, the westernmost point in Europe, where a series of high cliffs jut into the sea. The lighthouse keeper pointed west and said, "There is New York." I went with two English friends, both keen gardeners. We started off by train to Cascais, a little fishing village. However, it was Ash Wednesday, and the bus we expected to carry us farther never came. While we were waiting, we watched parents with their children dressed either in local peasant or historical costumes file gaily past us; sometimes a baby, carried in arms, would be all dressed up. Since there was no bus we took a so-called taxi, stopping along the way every time we saw an iris, lupine, or cistus, so we could climb out and pick it. At last we came to our rocky slope that led to the Cabo to find the whole of it yellow with *Narcissus bulbocodium* and purple with a little crocus-like plant, *Romulea bulbocodium*. On that morning in February we picked a great many flowers later identified for us by Dr. da Silva. It was cool and sunny — like a cool spring — and the weather remained like that the whole of my stay.

The flowers we found in and around the slope were *Scilla verna*, *Scilla monophylla*, *Astragalus lusitanicus*, *Salvia verbenacae*, *Helichrysum serotinum*, *Lavandula multifida*, *L. Stoechas*, *L. dentata*, *Anemone palmata*, *Lithospermum diffusum*, *Thymus Mastichina* (with a strange smell to the leaves), *Anthemis fuscata*, *Lupinus angustifolius*, besides a wild rose with white flowers, an iris of the Germanica group with light violet-colored petals, and *Armeria velvetia* with very large flowers (Portugal abounds in armerias). Later we saw clumps of naturalized rose geraniums. Elsewhere in Portugal a yellow oxalis and a form of *Vinca major* that is not a trailer (it is tall and has large blue flowers) are common weeds.

From Estoril I drove up to Coimbra, to the old university founded in the fourteenth century, to see its botanical institute. I went part of the way along the Tagus valley, where every bit of cultivation is done by men and women using mattocks in the heavy soil. In addition to this hard work, the women, many of them barefooted, carry all the water they use in crocks on their heads. They also, but at different times, carry huge baskets of vegetables to market and sometimes have a bunch of flowers in one hand. Their carriage is superb. I must say not only are they handsome, but they look serene. Maybe they have solved the problem of how to be happy.

I stopped often at the highly decorative markets where cabbage seemed important as also sorrel and what I thought was a collard. There were always flowers for sale. There is a saying in Portugal that a typical home has cabbage cooking on the stove and flowers in a vase near the entrance. Along the road, mimosa and broom were yellow with bloom. A castle appeared to be located on the top of every considerable mountain, so I concluded there must have been plenty of strife between the feudal lords in olden days. Now, the Portuguese are a dignified and gentle people.

In Coimbra, early in the morning, I walked up the steep slope through narrow twisting streets to the top of the hill on which the university is situated. It is the custom for all the men students to wear black, a suit similar to a Prince Albert with a romantic cape slung over one shoulder, both

School of Floriculture, Jardin Botanique, Coimbra

Behind the gate may be seen the statue of Brotero, Jardin Botanique, Coimbra

made of cloth like that worn by priests. Each student carries a black roll, resembling an old-time music roll, from which dangle ribbons in colors to indicate which of the schools he attends, whether it is medicine, science, the arts, and so on. The girl students wear conventional clothes.

The botanical building was formerly a monastery; it has been completely renovated and has most up-to-date laboratories. After Dr. Abilio Fernandes, the Director had showed me part of the building, we returned to his office. Presently in walked one of the most beautiful women I have ever seen. I was breathless at the sight of her. Dr. Fernandes seemed to expect this effect and said, "Permit me to introduce you to my wife." Senhora Fernandes is a botanist and curator of the herbarium. She showed me her work, also the rest of the university, including the very barocque library. The garden is built on several terraces, and was probably done over in the eighteenth century. It has herbs and other plants; the collection is being built up. There are greenhouses, and I was shown the old tile labels with the names of plants baked into them.

Dr. Fernandes is an authority on the small bulbs of Portugal. I wish we could get some of them here, for there are many beautiful ones we do not have which might add greatly to the appearance of our spring gardens.

From Portugal I flew to Rome, arriving the fourth of March. While there I went to see the Countess Mary Senni, whose garden at Grotta-Ferrata is known for its thousands of different iris, all hybrids created by its owner. They are set out under an olive orchard, and I am told that it is an unforgettable sight when these iridescent flowers bloom under the silvery leaves of the trees.

From Rome I took a C.I.T. bus to Assisi and on to Perugia. As the bus approached Perugia, I noticed the perfect cultivation distinguished by neatness and richness of plant growth. The field crops in Italy are cultivated like gardens. Each blade of grain stands forth like a flower stalk — there are not any weeds and the growth is uniform. The people love their soil, which they have kept fertile for nigh unto three thousand years. I did not see any farm machinery and noticed only the white oxen ploughing fields, but I am told such machinery exists and is being used, alas!

The typical fields in which grapes for Chianti wine are raised, have mulberry trees spaced quite far apart and their branches cut back hard. The vine is trained on these trees. Between the trees there is a field crop such as wheat, faba beans, or some vegetable. The leaves on the trees are for the silk worms, and the fruit is fed to the pigs. There were many olive groves, also having field crops under them.

In Florence, through the kindness of Miss Elizabeth C. Hall, Librarian of The New York Botanical Garden, I met Mrs. Joel Hunter and visited her son-in-law and daughter, Mr. and Mrs. Gordon Morell, who live in a former old monastery adjoining the Boboli gardens. Mr. and Mrs. Morell have transformed the monastery into a lovely house, and mimosas and pot plants flourish in front of their drawing room.

Mrs. Hunter went with me to the botanical garden where, in the absence of Prof. Dr. Rodolfo E. Pichi-Sermolli, we were shown around by Signora Ornella Vergnano. The herbarium has three million specimens. The garden is being restored, for the Germans camped in it, and since there was no place to bury the dead during the years of the occupation, they were buried in the garden. However, the old avenues of trees are being cleared and greenhouses and flower beds are being replanted. The greenhouses are leantos, placed against the building, similar to the old-time orangeries. The plants grow tall and thin, being in tiny pots, to preserve space. Off to one side is a fine collection of well-grown azaleas, each plant in a handsome pot. I hope to send some of the new American azaleas, in which they are interested, to them.

From Florence I went to Pistoia to see the nurseries. There must be twenty or more of them, all beautifully kept. The bushes and trees are wrapped in a kind of basket made of raffia, which is sunk into the ground when they are planted, and is a thousand times better looking than our feed bags held in place by cords. In one nursery where I lingered because of its rare plant material, in spite of a heavy downpour, the owner could not speak the languages I speak, and I could not speak his, so we conversed in a sort of Latin. Many roses are being grown in Pistoia, but the center of the Italian rose industry and the greatest place in Europe for them is at Padua.

At San Remo I visited the Stazione Experimental de Floricultura, the head of which is Signora Giuliana Eva Mameli-Calvino. Her husband had been the former head. Work on carnation and rose breeding has been done there, and in the adjoining terraced

garden are some rare plants.

Indirectly through Miss Hall again, I met the Countessa Boutourlin, a keen gardener. It was she who told me of the wild herbs in Calabria and offered to go with me and to Monte Pellegrino for bulbs (another time). She also told me to visit the Hanbury gardens and Signor Commandatore Domenico Aicardi at San Remo. The Hanbury gardens now belong to the government and are fine, though not as well cared for as formerly. However, the place is very green for that part of the country because of the wise choice of plant material.

Senor Aicardi breeds roses and carnations. He is the creator of 'Eternal Youth,' 'Signora' and 'Saturnion,' all having been patented by Jackson and Perkins. He, as well as I, have been great friends with J. H. Nicolas. He is eighty-three years old, very spry and keen, and unbelievably modest. His whole work was destroyed by the Germans in 1946, and he started all over again. He plants seeds of his roses, and they bloom for him the second year.

Senor Aicardi also raises carnations which, with roses running second, are almost the main industry on the Riviera. The carnations are grown on terraces, out of doors, with no protection and are guided by strings as they are in our greenhouses. Millions and millions of plants cover these southern terraces with their grey stems, and all are renewed each year from cuttings. The flowers are picked in bud and stand in huge basins of cold water in the shade overnight, during which time they open. Then they are packed very tightly in wicker baskets and shipped all over Europe.

All along the Riviera, plants with fragrant flowers and foliage predominate, and the scent is delicious. *Laurus nobilis* was in bloom and *Coronilla glauca* and choisyas. *Teucrium fruticans* with dark blue flowers is used as a hedge; it sometimes grows over six feet high, and it is handsome with its deeply colored flowers contrasting with the pale grey foliage. At Nice, undoubtedly due to the influence of the garden at Monaco, they go in for cacti and sell small flat baskets filled with tiny pots, each with a different cacti in it, even at the railway station. Along the shores, where the ground is rocky, the principal shrubs are cistus and rosemary. In Portugal the flowers of rosemary are pink, while in France and Italy they are blue. I am to get rooted cuttings and seeds of the pink form.

On the hills high above the Mediterranean, I found *Allium neapolitanum,* a lovely white-flowered plant not smelling of onion. There were ornithogalums, narcissi, and whole fields of *Anemone nemerosa* and *A. coronaria* and the usual grape-hyacinths and true hyacinths. I also saw a dwarf iris, very like *I. pumila,* in meadows on my way to Montpellier and a yellow dwarf in Dr. Braun-Blanquet's garden.

Montpellier, a city of 100,000 inhabitants, subsists entirely on the university and on the wine grown nearby. Most of the medieval part was destroyed during the religious wars, and many of the buildings date from the seventeenth century. A fine esplanade-like park in the style of Le Notre has avenues of clipped plane trees and a superb equestrian statue of Louis XIV.

In the morning I took a taxi to the Station Internationale de Geòbotanique Mediterranneene et Alpine. It is outside of the town and situated in an old house standing back of a charming old garden. Not knowing what would be behind this impressive title, I rang the bell and was greeted by Dr. Braun-Blanquet, a gentle frail old gentleman who seemed absorbed in his work. He was pleased to have a visitor from the United States and showed me some of his charts and maps that plotted possibilities and impossibilities of growth in certain areas, notably those not far from Montpellier. In some fields the land is being brought into cultivation by planting of certain grasses.

Dr. Braun-Blanquet took me through his garden and lovingly expatiated on the *"plantes sauvages"* he had collected. A *Lilium candidum* had seeded itself.

Then I went back to the university in the town and saw the new buildings to house the botany department. There are one thousand students of botany — most of them are either doctors or scientists. The ones who are entirely devoted to botany, here as well as elsewhere, either go into research or become teachers. I imagine this is as fine a botany building as exists anywhere.

Dr Hervé Harant showed the garden to me. He, too, showed me old labels which have the names carved on stone. The school of medicine was begun in 1220, and Nostradamus taught here in 1529. Other famous people who taught here were Pierre Magnol, Lobel, Guillaume de Rondelet, Bauhin, Dalechamps; Charles de l'Écluse in the sixteenth century; also de Candolle, Rabelais, Antoine de Jussieu, Fuchsius, and Tournefort. A distinguished roster! Busts of the former heads of the botanical garden stand around one of the smaller enclosures. The garden dates from the sixteenth century. Where the ground has been stepped into small terraces, it is planned to grow the native flora. There is a hill they call a "Montagne," begun in 1622, and a little pond for aquatics. Here, too, the Germans did a great deal of damage.

In Paris I had often been to the garden at the Museum Nationale d'Histoire Naturelle, but never in the large modern building devoted to the Laboratoire de Phanerogamie. I was shown the herbarium by Mme. Tardieu-Blot. Everyone on the staff, she told me, had done some service abroad and hers had been a three-year stay in Indo-China. In this magnificent herbarium, floor after floor is devoted to specimens. Each bundle is tied, and the bundles are kept in steel cabinets and frequently disinfected. The plants are arranged according to continents, and many of them have come from the colonies. I was told some of Abbé David's collection had not yet been identified. When a specimen arrives, it is given a temporary number and place. The whole laboratory is vast, and one is impressed as everywhere in Europe by the centuries of work that have gone into building up these fine collections. Mme. Tardieu-Blot showed me a specimen dried by Lobel.

I then walked down a back road named after Cuvier to where the gardening is being done, to the working part, and saw the collecting of seeds for exchange, and where the drying and naming of seeds is done by the whole staff in winter. They pride themselves on their labels and have a huge machine to print the names.

Henceforth, when I do my bit in our Garden or grow a few rare plants and share them with our Garden, I shall have a much greater sense than I ever had before of belonging to a vast group of scientists. I only wish more could have the same experience I have had.

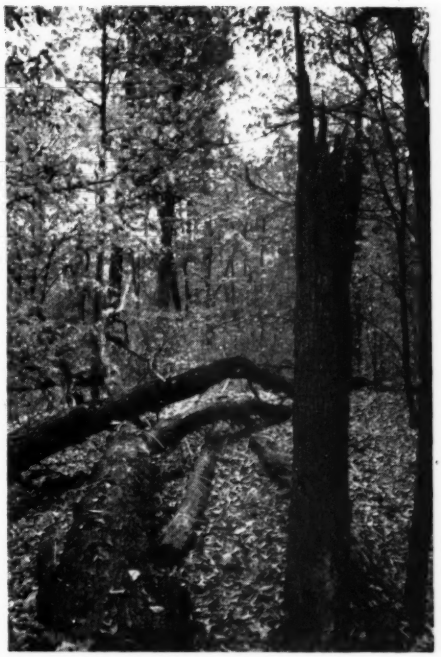
METTLER'S WOODS

By Gily E. Bard

In Somerset County, New Jersey, near East Millstone, there is a sixty-five acre forest that appears to be doomed to extinction by man. The loss of any forest in this age of ever-increasing urbanization is regrettable, but the loss of Mettler's Woods would be a calamity. Mettler's Woods is one of the few remaining tracts of the once immense forests that greeted the first Europeans settling this country. Beautiful, ancient, and the repository of a vast storehouse of scientific lore, Mettler's Woods thus has been triply endowed by Nature and thus triply merits our protection.

Historical records indicate that the forest was first acquired in 1701 by a Dutch settler and that it has remained in the same family since that time. It was never cleared or farmed but treated largely as a preserve. The present owner is unfortunately impelled to sell the Woods at this time. Although attractive offers have been made by lumbering and housing interests, the owner has agreed to sell the forest for $75,000, provided it can be saved for study.

The Citizens Scientific and Historical Committee for the Preservation of Mettler's Woods, with headquarters at Rutgers University, New Brunswick, New Jersey, has been actively engaged in obtaining the necessary funds. The University has agreed to set the Woods aside as a sanctuary, and thus preserve the forest forever. So far, $40,000 have been collected from thousands of donors ranging from the school children of New Jersey to great public benefactors. The remaining $35,000 must be obtained to save the Woods. All those concerned about the fate of this unique and beautiful forest have been urged to aid in its preservation by sending contributions to the Committee at Rutgers University, New Brunswick, New Jersey.



Mettler's Woods is one of the few remaining tracts of our original northeastern forests. It is a forest of great beauty and scientific value and now requires our protection.

Mettler's Woods has withstood the vagaries and ravages of time; despite fires, hurricanes, and other similar phenomena, the forest still stands as one of the most imposing sights in central New Jersey. The trees of Mettler's Woods are distinguished not only by their size and variety, but also by their extreme age; many of them are over three hundred years old. The dominant trees of the forest — dominant both in stature and basal area — are white, red, scarlet, and black oaks and various kinds of hickories. Some of these trees are as much as ninety feet tall and over four feet in diameter near the base. One of the largest white oaks has a circumference of ten feet, ten inches. All in all, there are about thirty species of trees in the forest, including flowering dogwood, ash, maple, and beech in addition to the oaks and hickories. Of the shorter trees, dogwood is the most conspicuous member; a fact which is easily verified by a rewarding trip to the Woods during May when these lovely trees bloom.

The charm of Mettler's Woods abides not only in its magnificent old, huge trees with their dogwood and maple neighbors, but also in the varied shrubs and herbs gracing the forest floor. About thirty species of shrubs may be found throughout the Woods, the most common being the maple-leaved viburnum. Other attractive shrubs found are black haw, spicebush, and bittersweet. A feature of the vegetation, which is especially welcome to visitors to the forest, is the comparative absence of poison ivy. This relative absence is in decided contrast to the situation obtaining in open fields contiguous to the Woods, where more than twenty-five percent of an individual field may be covered with this noxious plant.

Like most forests of its size, Mettler's Woods exhibits an actively-flow-

ering herb population only in early spring before the leaves of the trees have fully expanded and formed a canopy shutting out most of the sunlight. In early spring, one can always find refreshing patches of spring beauty, may apple, violets, and similar attractive herbs. Later on in the summer, the fruits of Jack-in-the-pulpit, Solomon's seal, and others add color to the ground vegetation. The beautiful herbaceous saprophyte, Indian pipe, is also a denizen of the Woods, and its ghostly white or pink coloration may be seen enlivening the forest floor.

In addition to the herbs, the Woods contain numerous ferns, mosses, and fungi. All undisturbed forests have their natural quota of fallen trees, and it is these which provide wonderful habitats for some of the various mosses and fungi present in Mettler's Woods. Much as we enjoy seeing the vivid coloration of spring flowers or the noble aspect of huge trees, it is the sight of gently-decaying logs covered with carpets of moss or glistening fungi that impart to us a sense of great peace in an old forest.

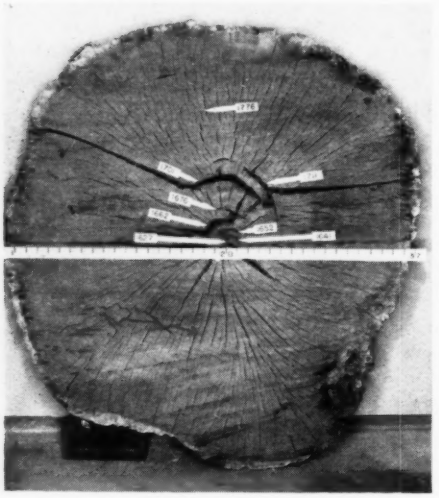
While the total aspect of Mettler's Woods is indeed one of peaceful beauty, its spirit is not that of a static calm, for movement is always perceptible. Woodland birds — myriad warblers and thrushes among others — summer in the Woods and join the numerous nuthatches and other hardy birds which have wintered there. If Mettler's Woods were destroyed, countless birds would doubtless be lost as a consequence. Large numbers of squirrels, chipmunks, hares, and similar small animals also reside in the Woods and play active roles in the life of the forest. From the largest deer to the tiniest chipmunk, there is a dependence on the Woods which is as instructive as it is awe-inspiring.

Professor Murray F. Buell measures the circumference of one of the largest white oaks in Mettler's Woods. Last fall, the trunk of this tree measured ten feet, ten inches, and it is still growing!

It is this dependence of all the species — both plant and animal — on each other and the Woods as a whole which comprises the essential beauty of Mettler's Woods. More beautiful indeed than the physical attributes of the forest is its symmetry in the natural scheme of things. Such a forest, representing a culmination, a community in equilibrium with all the factors of its environment, constitutes a climax community. Mettler's Woods comes as close to representing a climax community as any forested tract situated in an area of intense human activity. So long as the climate remains unchanged, so long as man does not intervene, Mettler's Woods should continue to endure as an oak-hickory forest host to the same species of plants and animals year in and year out, decade after decade, in short, until the environment alters. Assuming that the environment remains stable, Mettler's Woods will probably remain as it is today and as it has been for centuries. The individual plants and animals may die, but their descendants will always find their respective ecological niches in the forest. Thus our great-grandchildren should find Mettler's Woods little different from the forest we know.

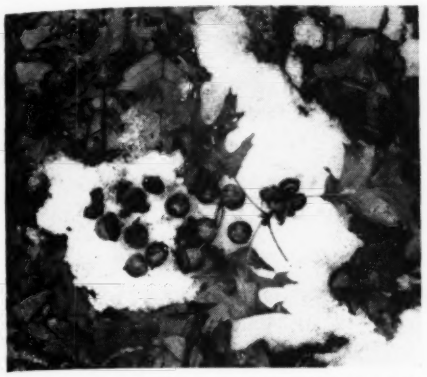
This was the nature of the widespread forests which were finally stabilized after the last great ice-age, the forests characterized as primeval or virgin. So few such forests are left in the Northeast, that it has become almost impossible to study our native flora in undisturbed condition, undisturbed, that is, in time as well as space. It is for this reason that Mettler's Woods is so valuable a forest from the scientific point of view.

What are the growth potentialities of our native species? What are their relationships to each other? How do they affect the soil, the microclimate, and the other factors of the environment? Answers to questions such as these and many others can only be attempted after prolonged investigation in climax communities, such as Mettler's Woods.



A section of the trunk of a white oak (three hundred and twenty-three years old; average basal diameter, forty inches) which was blown over by the hurricane of November, 1950. The tree began growing in 1627 and was already one hundred forty-nine years old in 1776 when our Declaration of Independence was passed. The other dates refer to scars caused by fires. A review of the forest of Mettler's Woods, by Professor Murray F. Buell, Dr. Helen F. Buell, and Professor John A. Small is available in the *Torreya* section of the current *Bulletin of the Torrey Botanical Club.*

Mettler's Woods has already been the focal point of several studies involving the vegetation of central New Jersey, and research in this area is currently being conducted by Professors Murray F. Buell and John A. Small and Dr. Helen F. Buell of Rutgers University. Meteorological instruments have been placed both in the forest and in adjoining open fields in an effort to compare the microclimate within the forest with that of the open fields. Various types of measurements of the trees are constantly being taken to determine the rate of growth throughout the entire year of the individual species, and similar studies are being conducted on the herbaceous vegetation.



The floor of a forest is a good indicator of its status. Mettler's Woods is a mature, stabilized forest. Here acorns of red oak and a young oak seedling appear above the snow. As long as the individual species of Mettler's Woods reproduce themselves, the forest will continue to exist in its present form. Note also the cushion of leaves and humus covering the soil.

If the forest is saved, not only may the investigation of such botanical problems be continued, but that of many other scientific problems as well. Ornithologists, entomologists, herpetologists, and other zoologists, meteorologists, geologists, and soils scientists all find Mettler's Woods a potential source of needed information. In central New Jersey, it alone can supply the answers to the numerous scientific queries regarding our original forests.

If Mettler's Woods were lost, not only central New Jersey, but the entire Northeast would sustain a great vegetational loss. It stands as a vastly interesting link between the maple-beech-hemlock climax forests of New York and New England and the southern oak-hickory climax forests, for it contains elements of both and differs from them basically insofar as the climate differs in each of these three areas.

The things valued most are often those that cannot be replaced, and Mettler's Woods constitutes an example of this. From studies made in central New Jersey by the author, it may be concluded that if the Woods were felled, it would require at least one hundred years for a very young oak-hickory forest to be re-established in this region through the processes of natural vegetation. (This, of course, is based on the assumption that any given area could remain undisturbed for such a long period.) Another three hundred years would have to elapse before this re-established forest would assume the same general aspect of Mettler's Woods as the latter is today, and even then it would not be quite the same, for its history would be different.

Certainly within our own lifetime and even within the next two or three centuries, Mettler's Woods could not be replaced. We must not permit man to destroy in one year what Nature has taken hundreds and thousands of years to fashion. To save the Woods, send your contribution, no matter how small, to the Citizens Scientific and Historical Committee for the Preservation of Mettler's Woods, c/o Professor William H. Cole, Rutgers University, New Brunswick, New Jersey. Such donations are, of course, deductible for income-tax purposes.

Thermometers and other instruments have been installed in Mettler's Woods to aid in scientific investigation of the forest. Here Dr. Buell reads a thermometer designed to indicate maximum and minimum temperatures. Similar thermometers are placed in the soil and also six inches above the forest floor, and a fairly complete record of the microclimate of the Woods is thus obtained.

The original forests of this country are part of our national heritage, and it is our duty to preserve them for posterity. If for this reason alone, we must save Mettler's Woods.

Professor Buell examines a large over-turned pin oak, another hurricane casualty. Note the tremendous root-system of this tree and how deeply enmeshed are the individual roots in the soil.

My Hobby is—KEEPING ORCHIDS HEALTHY

By Ernest N. Cory

THERE is such a vast array of species and varieties among the orchid family, that grow under various conditions of temperature and moisture as air-feeding plants (epiphytes) or as terrestial plants, that any person can find the kind of plants that suit the conditions he has to offer. Consequently, you and your friends can grow orchids as your hobby without a large outlay of cash. A greenhouse is most desirable but not essential, and there are parts of the United States where orchids may be grown successfully outdoors.

If you have a window that has sunshine entering it at least part of the day, orchids may be grown there. You should provide a means to soften the impact of the direct rays by suitable shading, usually with cheese cloth or, if you prefer, nylon net. Another *must* is to keep the humidity high by using a waterproof pan three or four inches deep containing small pebbles or gravel that can be kept moist constantly. On the surface of the gravel, you can place the potted orchids. They will need to be syringed on bright days. The temperature of the normal house in winter of 65° at night and 70° - 75° during the day will be satisfactory for most orchids. You may enclose the pan and window or leave the plants as an integral part of the room. In the latter case, the perfume of many species and varieties will be an added attraction.

It is not enough that you check the requisite temperature, moisture, and light, but you must be alert for any insect infestation. An orchid that is given reasonable care as to potting and environmental conditions is virtually immortal. While some of the back bulbs may die, the fronts continue to live to produce new shoots and they, in turn, produce flowers.

They won't flower, and they will die if insects are neglected. Not only do insects actually kill plants, but they may transmit virus diseases that may kill the plants and most certainly will be responsible for color breaks and crippled flowers.

The most persistent and most commonly encountered insect is Boisduval's scale on cattleyas. Another species is common on cypripediums and a third is frequent on cymbidiums. In general, the scale insect begins its active feeding under a sheath and usually near the tender bud. As it grows in size from a tiny jelly-like speck of tissue, it covers itself with a secretion of wax; the females are covered with a round disc of wax and the males with more or less rectangular plates of wax. At maturity the female is about one millimeter (one twenty-fifth of an inch) in diameter, oyster white in color, with the last cast skin of the nymph or developing scale as a central nipple. The males vastly outnumber the female scales and pile up on the pseudo-bulbs and on the underside of the leaves as cottony-appearing masses as much as an inch in diameter. The scale feeds on the juices of the plant and is quite likely to destroy the new "eyes" or buds. In that case, immortality becomes mortality.

Other scales have similar life histories and their control is dependent upon the placing of a very fine residue of DDT on the plants so that when the crawlers emerge from under the old female scale and seek a new place in which to insert their thread-like beak and begin to feed, they will be killed by the contact with DDT particles.

The formula developed by the author is made from technical DDT — 190 gm. in 568 cc. of Xylol and adding 190 cc. of Triton (X-100) as an emulsifier. 20 cc. of this emulsion is used in one quart of water on all orchids except cypripediums, on which only 10 cc. per quart should be used. This should be repeated at monthly intervals, until all scale has disappeared. Thereafter, treat all new plants you get, before you put them among your clean plants. A very fine mist spray, such as you can achieve with a new hand - operated, plunger - type, quart-size sprayer, commonly called a "Flit" gun, is essential. Spray until the material begins to run off. As you spray turn the plants and finally place them on their sides so that the under surface will be coated with fine particles. A spray similar to the author's formula may be purchased from firms dealing in orchid supplies.

This same spray will kill the dendrobium weevil, a small black beetle, the larvae of which feed within the roots. The adults delight in taking a nip out of a flower bud or the terminal shoots of dendrobiums. It will also kill thrips. These minute winged insects scarify the tissue of any kind of seedling and the more mature tissue of cattleya leaves and the edges of the unfolding flower. They will kill seedlings by their feeding and so poison the tissue of cattleyas that their productive capacity is reduced.

This spray will not kill all the spider mites, some of which are extremely injurious to many kinds of orchids. Dendrobiums are favorite food of a false spider mite, known as *Brevipalpus australis*, that is present on orchids in many areas. Associated with the mites are depressed, necrotic brown areas that heretofore have been ascribed to various ecological or environmental conditions. Likewise, the blackening of the sheath around new growths and the subsequent loss of those growths have been attributed to poor ventilation, improper watering, or the wrong amount of heat. It now develops that this condition is due to the presence of very minute eriophyid mites. In order to control mites the best commercial sprays available generally are "Kilmite," (40% Hexethyl pyrophosphate, "Dimite" (25% Di (p-chlorophenyl) methyl carbinol), and "Red Arrow Garden Spray" (Pyrethrum-Rotenone, Synergist Spray), used respectively at one, one-half and one teaspoonful to one quart of water.

Orchids are no harder to grow than many other flowering plants. They require study of their needs and careful examination for insect pests. Buy species cattleyas and other genera to begin with. They are relatively cheap now. Learn the right way of potting, study their needs, and later you may want to purchase fine hybrids. They are much more tolerant of continuous growth than species which usually require a resting period, corresponding with the dry season in their native home, and then abundant water after they begin to grow. Keep them immortal by protecting them from pests.

13

SMALL TO MEDIUM-SIZED

TREES

By Clarence E. Lewis

When the wind blows, the white bracts of *Davidia involucrata* resemble a dove on wing

INDIVIDUALS like to have something different from that which their friends and neighbors possess; they enjoy any possession that is unusual and distinctive. This is just as true with trees as it is with antique furniture or objects d'art.

Trees, however, must be more than only rare. They must have certain qualities which set them apart. These less known trees must be noticeably attractive and have such outstanding characteristics as unusual flower or period of flowering, striking fruit or winter-persistent fruit, and interesting bark. I have selected thirteen small to medium trees that fall into this category.

The dove tree, *Davidia involucrata*, is a small to medium tree that is valued for its unusual flower. I have classified it in this group because rarely in the Northeast does it exceed thirty-five to forty feet. (I understand in areas more conducive to its growth, it will reach a height of sixty feet.) The flower of the dove tree is unusual in that the true flower is a yellowish tan ball in the center; the white parts are bracts, not petals.

This tree generally blooms in May; here on Long Island, it starts about May 1 and is in full bloom May 8 to 12. When the wind blows, the white bracts seem to flap in the breeze and, if one's imagination works overtime, they may seem to resemble a dove on wing. It is unfortunate that the dove tree does not flower willingly and that it may be several years before it produces any flowers. Even then, it may not flower every year.

The leaves are rather coarse and are heart-shaped with strongly-toothed margins.

Not infrequently a home gardener is impatient and seeks a quickly growing tree that will flower and provide shade in five years or less. *Pterostyrax hispida*, epaulette-tree, answers these requirements fairly well, for at an early age it bears large creamy-white flower panicles in June, and they are fragrant, too. This coarse-leaved tree, because of its quick growth, has the tendency to sucker and needs to be pruned regularly to hold it in good form. The flowers and the tan fruits remind one of the epaulettes worn by admirals.

Another quickly growing group of small trees is the flowering peaches, planted in limited numbers as compared with the flowering crabapples. The flowers come single or double, vary in color from white to pink, red, and striped, and appear during late April or early May.

Some of these small-sized trees produce flowers at a time when few trees or shrubs are blooming. The Japanese snowbell, *Styrax japonica*, bears its fragrant, white, bell-like flowers in June on the undersides of the branches of the dense-foliaged, spreading, small tree. Its height is usually twenty to twenty-five feet. It has excellent, glossy, dark green leaves covering a smooth, interesting bark. The bark usually passes unnoticed, but it is light

Idesia polycarpa with persistent colorful fruit makes an interesting lawn specimen

tan with clean, fine stripes.

The stewartias appear soon afterward and begin to show their single white flowers with orange-yellow stamens in late June and carry well into July. Others seem to be more widely used, but I like the Korean stewartia, *S. koreana,* because of its abundance of good-sized flowers. It is listed as a medium tree, but it is seldom one finds *S. koreana* more than twenty-five to thirty feet tall. The mottled bark is an additional attractive characteristic.

A larger tree whose good qualities went unrecognized for many years is the Japanese pagoda tree, *Sophora japonica.* A tree to fifty feet or more, it has locust-like leaves and yellowish white flowers in August, which give an almost mist-like appearance. The Japanese pagoda tree is desirable as a lawn shade specimen, for there is no problem in obtaining a good stand of grass beneath it provided, of course, there is reasonable soil for growing grass.

Another quickly-growing tree that flowers in August, and even September, is the silk tree, *Albizzia Julibrissin,* and its variety, *rosea.* It is a small tree seldom exceeding a height of thirty feet, and within five or six years forms a broad head—a very attractive shade tree for a small terrace. The albizzia not only has an interesting late flower but also delicate fern-like foliage. Variety *rosea* is reputed to be hardier, but it is not so large. Stem canker sometimes bothers this tree, but it can be cut out — and its fast growth overcomes this problem.

A little known tree, with a persistent colorful fruit is *Idesia polycarpa.* The pendulous clusters of orange-red fruits begin to color in August and hang on the tree into late fall; but the remarkable thing is that when brought indoors, the fruits remain firm until March of the next year. It is a broad-branched tree of a maximum height of thirty to thirty-five feet. The leaves are large and heart-shaped; because of the coarseness, it is not suited for very small properties. However, on larger properties it makes an interesting feature when used as a lawn specimen in the distance. *Idesia polycarpa* is dioecious, so there must be a staminate tree to pollinate the pistillate tree in order to insure fruits on the latter.

The flowering peach is a desirable quickly-growing small tree

A maple that deserves more recognition and greater use is the hedge maple, *Acer campestre.* This is a desirable subject for narrow streets, as it usually does not spread wider than fifteen feet and rarely reaches more than twenty to twenty-five feet high. Its leaf, clean and interesting, is one-third to one-half the size of the leaf of a Norway maple. The stems often become laden with corky ridges which add to rather than detract from its desirability. As its common name indicates, *Acer campestre* makes a good hedge—though not an inexpensive one.

A pine that has interesting bark is the lacebark pine, *Pinus Bungeana.* This bright green, three-needle pine attains a maximum height of fifty feet. It has a round umbrella head and a short or multiple-stemmed main trunk —the latter is more common. Because of its slow growth and high crown, *Pinus Bungeana* is acceptable on the small place.

A fascinating tree, but larger, is the golden larch, *Pseudolarix amabilis.* It has reached, in some instances, a height of seventy-five to one hundred feet, with a spread of fifty — so, perhaps, can hardly be considered a small tree. The spray-like clusters of deciduous leaves or needles which begin as fresh green, later turn golden-yellow over the horizontal branches.

The last in this parade of trees is the katsura, *Cercidiphyllum japonicum.* The fresh green, heart-shaped leaves add a note of dignity and restfulness to the spring show. The flowers and fruits of this dioecious tree are of little value. Its tendency is to develop several main stems, but it can be trained to a single, short trunk. Dry weather affects the appearance of the foliage; so as soon as a dry spell occurs, the katsura tree should be well watered. While not easily adapted to use as a shade tree because of the low branches, it is a wonderful foliage specimen for corners of lawn areas or near the front of a large house, so that it becomes associated with foundation planting. Here on Long Island, heights of fifty feet have been reached by *Cercidiphyllum japonicum.*

Pinus Bungeana, acceptable for the small place, has unusual bark

DAYLILIES . . . are Irresistible

By **Isabelle B. Henderson**

'Nantahala' is one of the most beautiful daylilies. Introduced this year, it commanded attention at the national meeting of the Hemerocallis Society in Valdosta, Georgia.

INTEREST in daylilies is snowballing. In fact, it is avalanching, and with a roar. People who never intended to go along with it are swept up and carried away. "I have over a *hundred* varieties already," says the new enthusiast. She may impress the beginning daylily collectors in her orbit — those with only fifty or so varieties in their collections (all labeled, of course) — but her pride and exuberance would bore the oldtimer who may have already thrown into the compost or over the fence, one, or two, or three hundred unworthy (to him) varieties, including some on her list and on "The Popularity Poll's" one hundred, also.

The really sophisticated hemerocallarian considers it pointless as well as vulgar to tell you right off how many varieties he has — even if he knows, just as he would consider it poor taste to gloat over the amount of his bank account, especially if he knew it was more than yours. Unlike a bank account, the value of a hemerocallis collection is based on quality rather than quantity, so a mere count means nothing, and persistent mention of numbers rather suggests that the owner may have an unselected and unculled accumulation of varieties, and not a collection which shows discrimination and judgment in selection. George Gilmer of Charlottesville, Virginia, is an exacting judge of hemerocallis. He measures all his daylilies by the same yard stick — performance — which makes no concession to the dollar mark. He threw out 'Garnet Robe' several years ago, because it did not take the southern sun. His file of those thrown out is much larger than his file of proven performers and new ones on probation. His daylilies must look fresh and sprightly at five p.m., when George Gilmer gets home from his law office.

"I have a better pink seedling than 'Marie Wood' or 'Evelyn Claar' or 'Pink Dream' or 'Picture'." This remark or one similar to it is probably being made by every single backyard hybridizer in the country, and they are legion. Mostly it is wishful thinking, but one day, it just may be true. When you multiply the backyard pollen-dabbler's seedling patches by a thousand or more, they become a formidable competition for the established hybridizers who, until recently, could be counted on the fingers of two hands. Some of them are meeting the new challenge by enlarging their seedling plantings. One who seems to believe in the law of averages but not in the law of diminishing returns, is said to have expanded beyond thirty acres and isn't fenced in yet! On the other hand, another hybridizer of unchallenged prestige does all her seedling growing in a few beds not much bigger than actual double beds or small bedrooms. In Mrs. Thomas Nesmith's Lowell, Massachusetts, garden, no tractors charge up and down, no children gather seeds in bushel baskets. There is just Mrs. Nesmith with her well-worn record book, her intuition for knowing which pollen to put on what, her remarkable ability to evaluate what she produces, and her delightful flair for naming and describing her introductions. She is the inspiration of many hybridizers, big and little, but especially of those who have small space. Mrs. Nesbit has proved that space is not a limiting factor.

The Hemerocallis Society's Year Book has given everybody a chance to be known. A new hybridizer no longer waits in his backyard, until Dr. Philip G. Corliss gets around to discovering him. He can now advertise his daylilies in the Year Book, if they are properly registered, and so be known to the hemerocallis world whose gadabouts will surely look him up and whose eager-beaver collectors will probably order from him, unless his prices are out of line. A hybridizer can put any price he chooses on his creations. (When an artist puts an enormous price on his painting, it suggests that it is more important to him to bolster his self-esteem than to sell his picture.) A remarkable list of unregistered clones went out recently from an unknown eccentric, everything ecstatically described and listed at fifty each — dollars, that is — but with a few bargains at twenty-five. These lists are now considered choice collector's items for scrap books.

So this is the hemerocallis world, zany, fascinating, full of excitement, adventures, jealousies, frustrations. I was part of it for a while, and I know. The rest of this piece is about my liberation.

During the period of my bemusement with daylilies, my garden was a muddle. I had an enormous planting of daylilies — yes, exactly five hun-

dred and twenty-seven varieties before I started throwing them out. I had thousands of seedlings, some dating from 1945. These grew where vegetables, raspberries, strawberries, and cut flowers had been pushed out. My perennial borders were filling up with daylilies. At blooming time, they were a riot of color. Afterwards, the great stretches of hemerocallis foliage were not good-looking nor interesting. It was at this point that I began to think about daylilies and their relation to the garden and to me.

Recently, several of the garden magazines have published articles which point out that gardeners fall into distinct categories — the designers who look at plants as forms, colors, and textures which, when properly arranged, will create beauty in the garden composition; the plant lovers, whose pleasure in the plants themselves eliminates any thought of how they look in the garden picture and with each other; the botanists, and the hobby gardeners who go like mad for one particular plant. This last group produces the collectors and hybridizers in the hemerocallis world. It is admitted that a gardener can combine two or more of these interests, but that he is never happy if he heads off on a tangent not in line with his basic inclinations.

I had slides to jog my memory of the garden in earlier summers. What was once a "lovesome spot, God wot" was, when daylilies bloomed, noisy, violent, stimulating, and on hot days decidedly irritating with its hot bright color. Where the ivy had not covered a fence, the garden could be seen from the street and frequently drivers slammed on brakes, unwilling to believe what they saw when the daylily color smote their eyes. In those days, I was trying to believe that any good daylily was a fit subject for an English style perennial border — oranges, yellows, reds warm and cold, bright and dull, so-called purples, so-called pinks, and the fussy bicolors and contrasty eye zoned ones. On one anguished day in June, 1951, came the necessity to eliminate either a hundred or more cold red and pink hollyhocks or a similar number of daylily clumps in hot oranges, fulvous, and orangy reds which had set up a McCarthy-Stevens atmosphere of conflict which was intolerable. I cut back the hollyhocks, which obligingly re-bloomed later with 'August Pioneer' and the tall phloxes. They were lovely. Even magenta in the phloxes was a welcome relief from fulvous daylilies. And cool, blue petunias were balm to my bruises.

I disliked all daylilies that summer. I was thoroughly disenchanted. The next summer, I took out all the fulvous ones, the dull and the too bright reds, most of the contrasty bicolors, and conspicuous eye zoned, the near pinks, the so-called purples. This added up to more than half of them. I brought in more yellows and all the pale ones I had. I filled the other vacated daylily space with plants chosen to give foliage contrast and varied flower form — veronicas, foxgloves, *Thalictrum glaucum*, plume poppy, yellow kniphofias, artemisia 'Silver King,' and *Eryngium amethystinum*, which turns completely silvery blue-violet at hemerocallis time. *Statice latifolia* is good then, too, with its clouds of tiny lavender flowers. I felt it would be wrong to put the dwarf daylilies along the edges, when it was variety that was needed, not repetition of sameness. I like mats of pinks, *Stachys lanata*, santolina, *Cerastium tomentosum*, and nierembergias. Most of all, I was overjoyed with the daylilies 'Show Girl' and 'Su Lin' sharing a bit of shade, completely beautiful; 'Lady Bountiful,' so welcome and so early; 'Mystic Moon' and 'Vespers,' with new blooms in the evening and fragrance heavy in the damp night air; 'North Star' against the green smoke of fennel; beautiful 'Taruga,' beautiful eyed 'Nantahala.' Also, beautiful veronica, beautiful globe thistle, and all the other beautiful things which enhance the charm of daylilies! Never again shall I try to find satisfaction in daylilies with more

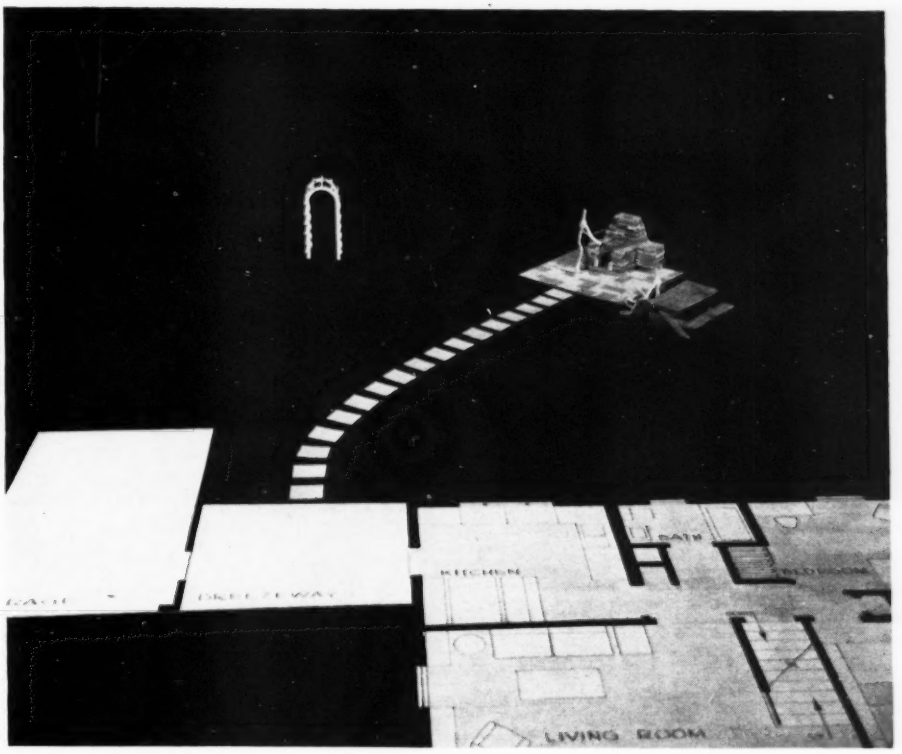
(Continued on page 122)

'Starlight' blooms prolifically in the author's garden in Raleigh, North Carolina

GARDEN STRUCTURES and ACCESSORIES

By George B. Tobey, Jr.

Photography by Cliff Arthur



YESTERDAY

LABOR-SAVING DEVICES, shorter working hours, and more available hours for leisure create a new pattern of indoor-outdoor living. In our recent past, the house and the piece of land, on which the house sits, were considered separate elements, with connection only by means of a flight of steps. Admittedly a short flight of steps, but none the less, the tenuous connection we knew even ten years ago was a vertical one. Windows, too, were high above grade, which led naturally to a feeling, a philosophy perhaps, that the out-of-doors was apart from inside living, an element to be looked at from within; not one to be used as much as the rooms of the house. The habit, therefore, was to get as far away from the enclosure of the house as possible, when actively engaged in outside activities.

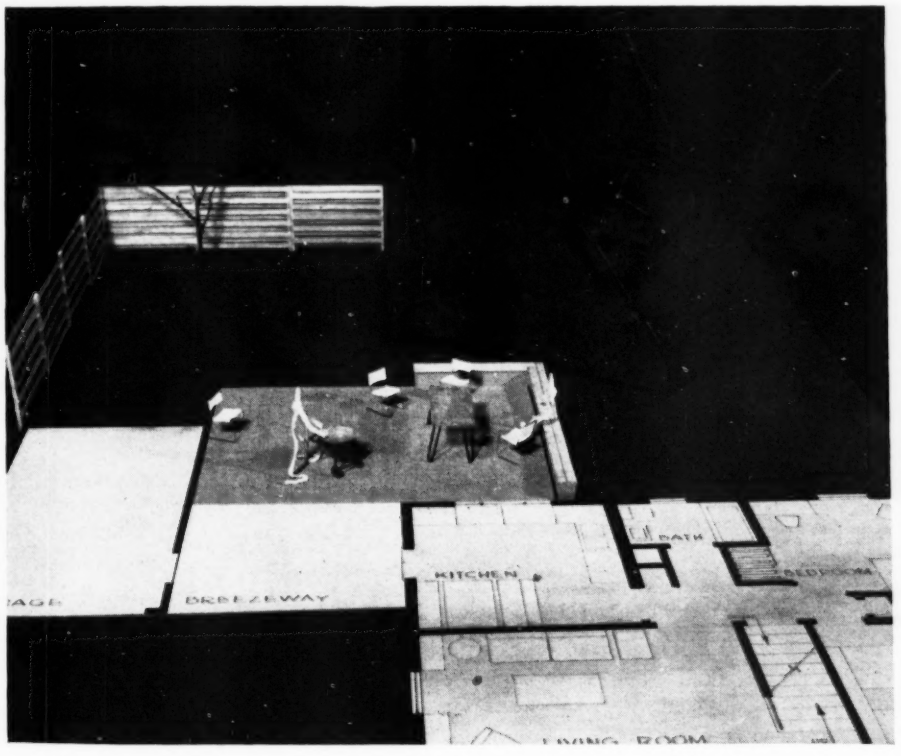
A very typical arrangement for outdoor "living" was that of the rustic stone fireplace, copied from those so frequently seen in state and national parks. Rustic appearance was demanded, to give the feeling of being far away from the confining feeling which yesterday's architecture subconsciously gave us.

The fixed fireplace, the heavy, unwieldy picnic table in the back yard had their place. They were once the only known solutions to the problem of providing outdoor eating equipment. They were sturdy, would stand weather, and did not have to be carefully protected in winter.

But, as outdoor eating became fashionable, as people spent more and more time outdoors, compromises had to be faced. The reasons for building a house are of course several, one of these being to provide privacy for family living. We are in a transitional period now, in which the boundaries of private family living are leaving the traditional four walls and reaching out to encompass the property lines themselves.

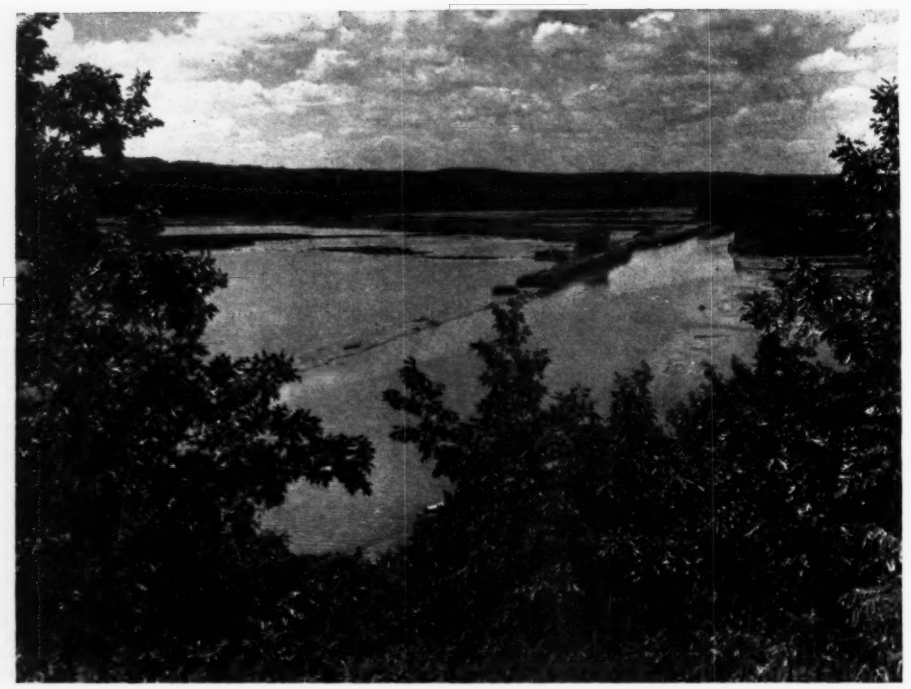
This means, in effect, that the home itself is becoming more closely integrated with outdoor living space. Greater window openings, in cases ceiling-to-floor glass walls, floor levels closer to lawn grade, and more convenient access to the outside activity

(Continued on page 122)



TODAY

Royal Botanical Gardens



Cootes Paradise — a heritage on the edge of an industrial city

By Leslie Laking

IN the year 1930, a communication from the office of the Governor General of Canada brought a message of importance to a project which was then beginning to receive public attention. This communication brought a name, for it carried the approval of His Majesty, the late King George V, to employ the term "Royal" in connection with the botanical garden which was being envisioned at Hamilton.

The story of land acquisition goes back beyond that historic occasion, for the Board of Park Management of the City of Hamilton under the capable leadership of the late Honourable T. B. McQuesten had, by 1930, a considerable acreage of land set aside and labelled "Botanical Garden Section." Although other public-minded citizens figured in the founding of this garden, the foresight and the tenacity of purpose which culminated in establishing the Royal Botanical Gardens by act of legislature, Province of Ontario, 1941, was that of Dr. McQuesten. The broad powers vested in the Board, which was to govern this botanical garden, become evident in these extracts from the Act of Incorporation:

"The Board shall have the power to and may establish and maintain upon its properties, parks, museums, zoological and other gardens, natural history collections, observatories, art galleries . . . and do all acts and things usually incident to the purposes of botanical gardens . . . receive, acquire and hold such lands . . . as it may consider advisable in the development of the Royal Botanical Gardens . . . give courses of instruction in forestry, nature study, botany, horticulture . . . promote research . . . collect information . . . publish same . . . cooperate with any educational institution or public body for any of the purposes of the board. . . ."

During the late war years the Gardens continued to operate as a part of the Parks System. In 1946, however, the first staff appointments were made and an ambitious programme of service with emphasis on three fundamentals — Education, Research, and Recreation — was launched. There is mutual pride and satisfaction in associations with McMaster University through both board and staff personnel, through biological research programmes, and through lands, for properties of the Gardens provide not only a setting for the University but, in addition, an outdoor laboratory.

The magnificent eighteen hundred-acre property combines unrivaled natural beauty of woodland, ravine, marshland, and escarpment with gardens developed as units in strategic locations. The entire area centers on Cootes Paradise Marsh surrounded by a deeply indented, generously wooded shoreline. The Desjardines Canal, which formerly served as the trade lane for the neighboring town of Dundas, forms a unique axis; and a portion of the Niagara Escarpment creates an even more unique garden wall overlooking a splendid panorama of Gardens property against a backdrop of industrial Hamilton.

The first developments completed in

Bottle-brush buckeye, *Aesculus parviflora*, by the side of the pool in the Rock Garden

—an 1800 acre botanical garden on the northwest boundary of the City of Hamilton, located at the westernmost tip of Lake Ontario, Canada

The Spring Garden — a spectacle of iris as seen by passing motorists

the early thirties include the Sunken Garden — a formal garden at the entrance to the University — and the Rock Garden — part of the development comprising the much admired northwestern entrance to the City of Hamilton. This latter garden, developed in an abandoned gravel pit, has become known and loved across the continent. It is essentially a display garden, gay with bloom from scilla-time until the last chrysanthemums fade. Among the famous plants here is a specimen of *Aesculus parviflora*, which has been described as one of the finest in the northern half of its range. The educational potentiality of this garden is increasing with each growing season. Perhaps the best evidence for this is to be found in the tremendous interest in the culture of the more showy tulip species in home gardens, which have been featured in the Rock Garden during recent years.

Since it began functioning as a separate organization in 1946, a programme was initiated enabling the Gardens to make a greater contribution in the realm of horticulture. Two projects, the Children's Garden and the Spring Garden, are now well established as a result.

The Spring Garden was conceived primarily as an iris garden, and as such has already made a name for itself on this continent. It has been developed on a lovely peninsula of land overlooking an arm of Hamilton Bay. The entire three-level garden is in turn overlooked from a bridge on the highway leading to Toronto, providing the magnificent view shown in the accompanying illustration. The collection of tall bearded iris exceeds six hundred varieties, and the massed color effect created by nearly two thousand clumps during the first three weeks of June is a thrilling spectacle.

Breeding trends are evident in historical sections, such as that displaying the winners of the Dykes Memorial Medal; elsewhere older varieties are contrasted with the more modern types. Important Canadian introductions and significant winners of the American Iris Society's Award of Merit contribute to the display. The most recent additions are "Guest Iris," which are being grown and displayed for the annual meeting of the American Iris Society, to be held in Hamilton in June 1955. The peony display follows immediately and fine collections of hemerocallis and lilies carry the garden through to September. The interest and generosity of friends in the United States and Canada have made these collections possible, and we are proud to relate that their interest is a continuing one.

Although every garden contributes to the over-all educational programme of a botanical garden, this aspect is perhaps best symbolized by the Children's Garden — a centre for teaching and learning through the experience of doing. This garden comprises some fifteen acres which, until 1947, was an

Learning by doing — a section of the Children's Garden on Parents' Night

abandoned hay field on the edge of a residential area in the west end of the city. Situated against a backdrop of oak woods, and adjacent to the ravine area on the south shore of Cootes Paradise Marsh, unlimited opportunities for study are presented.

The Children's House was erected in 1948 — a gift of the Junior League of Hamilton. Recently the interior has been finished and provides facilities for indoor gardening, reading, study, and project work. Junior students operate individual standardized garden plots, and seniors conduct separate projects, including the garden of special vegetables, where crops such as peanuts, okra, popcorn, and spanish onions are grown, a demonstration kitchen garden, and a vine-crop garden. During 1954, the demonstration potentialities are being further enhanced by the introduction of a fruit plot. The flower garden is another senior project which has become a favorite with the public, for it is here that many of the more promising novelties are grown.

Behind the children's work area is a planting of most of the species of native trees not found in the adjacent woodland. The front is landscaped in keeping with the purpose of the area, and the use of weeping higan cherry, *Prunus subhirtella pendula,* in a semi-formal setting, is proving singularly successful in carrying the Children's Garden theme beyond the project area.

Continuing a policy of developing gardens of seasonal interest, an Autumn Garden is being planned in Hendrie Park. This easternmost portion of the Gardens is one of the most interesting, with its long broad valley, wooded hillsides, meandering stream, and old coach roads.

Initial operations in Hendrie Park commenced in midsummer of 1953. The Hendrie Memorial Gates, donated by the Hendrie Family of Hamilton, were erected, creating an entrance; and the stone pillars associated with these magnificent Swedish wrought-iron gates were completed on the last day of April 1954.

The very nature of the Gardens property, with its vast marsh and woodlands comprising Cootes Paradise, demanded that the Royal Botanical Gardens have a Conservation Department. Since 1949, the Gardens have employed a conservationist who has as his "garden" this area of great natural beauty immediately on the outskirts of a rapidly-expanding city. Demonstration and experimental work concerned with aquatic plants, especially those with potentialities as food for water-fowl is in progress, supported by the Toronto Anglers' & Hunters' Association. Habitat units, including one with controlled water level, have been established for the above purpose. Reforestation and upland wild-life plantings have been introduced. The newest venture in this field, the establishment of well-marked Nature Trails, promises to have the broadest public appeal.

The current policy of the Gardens in relation to scientific matters is evident in the following quotation from the 1953 Annual Report:

"The most important asset of a young botanical garden is its living plant collections, and building these collections, both horticultural and botanical to a desired level, is our prime aim in the scientific realm at the present time. Such a programme is enhancing the Gardens in an obvious way through improved display and more basically through increased educational and scientific potential."

Plant collections are being increased rapidly, and particular attention is being given to the special horticultural groups previously mentioned and to woody plants. The propagation department has been enlarged and facilities improved. The decision last year to proceed with the Arboretum, space for which is reserved on the north shore of Cootes Paradise Marsh, is without doubt the most important advance towards a scientific garden. Already, progress has been made towards establishing an entrance which will be completed during 1954. The Lilac Garden, on a beautiful site along the shore line of the Marsh, near the Arboretum entrance, has been expanded.

Hardiness studies have already commenced, and the possibility of enormous expansion comes with the development of the Arboretum. A modest seed exchange list is published under the name of the Royal Botanic Gardens in the *Index Seminum* of the Dominion Arboretum and Botanic Garden, Ottawa. Though the herbarium is still in its infancy, it is growing annually and comprises both cultivated and wild plants of the Gardens. It includes, in addition, a comprehensive collection from neighboring counties in the heart of Ontario's "Carolinian Zone," resulting from a research project conducted jointly by the Gardens and the Biology Department, McMaster University, and financed by the Research Council of Ontario.

Administrative offices, library, herbarium, and meteorological station are located in temporary quarters. The building of a Botanical Garden Centre to house the above and, in addition, research and educational facilities will, it is anticipated, be a reality within five years.

The Royal Botanical Gardens is an independent organization, receiving regular revenue for maintenance from municipal sources through the Hamilton Board of Park Management and certain special income from private sources and membership. In recent years, capital grants from the Province of Ontario have been a source of tremendous stimulation, and there is every indication that the Royal Botanical Gardens is gradually taking the place with other significant botanical gardens and arboreta of North America which its founders envisioned.

ROADSIDE FLOWERS

We are the roadside flowers,
Straying from garden grounds;
Lovers of idle hours,
Breakers of ordered bounds.

If only the earth will feed us,
If only the wind be kind,
We blossom for those who need us,
The stragglers left behind.

And lo, the Lord of the Garden,
He makes His sun to rise,
And His rain to fall like pardon
On our dusty paradise.

On us He has laid the duty —
The task of the wandering breed —
To better the world with beauty,
Wherever the way may lead.

Who shall inquire of the season,
Or question the wind where it blows?
We blossom and ask no reason,
The Lord of the Garden knows.

— Bliss Carman

WILD FLOWERS
in The New York Botanical Garden

PART V

By **Joseph Monachino**

In last year's July-August number of The Garden Journal, *Geranium nepalense* var. *Thunbergii* was mentioned as found at the foot of the North Bridge (the former Boulder Bridge). Since then, a great deal of road work and grading have been done at the site, and the writer was asked whether the destruction of the station would mean the elimination of the species from the Park. This Japanese geranium can be located elsewhere: south of the picnic grounds near the old abandoned rock garden and at various places in the north meadows along the Bronx River.

The Garden is fortunate in possessing diversified terrain. It has a beautiful gorge that is unique in the city; it has hills, flood-plains, dried denuded slopes, numerous streamlets tributary to the Bronx River, rain sinks, lakes (now outside of its confines), rocky grounds and rock outcrops, footpaths and pavements, lawns and flower borders. Search for the three grasses mentioned below, *Paspalum*, *Danthonia*, and *Glyceria*, will demonstrate the correlation of habitat and plant life.

Paspalum laeve var. *pilosum* has hairy foliage and glabrous plano-convex spikelets compactly arranged in two or three ranks on one side of the rachis. The spikelets form a long slender chain, whence the name "chain-grass," as *Paspalum* has been called; but this common name does not appear in the standard manuals. The rachis is flattened on one side and has a central elevated ridge on the other; the convex backs of the closely fitted spikelets are set against the ridge. The linear catenulated spikes are racemosely disposed along the central axis. This variety of chain-grass is abundant on the lawns south of the Thompson Memorial Rock Garden, particularly in the picnic grounds. It was collected by G. V. Nash in The New York Botanical Garden as early as August 27, 1896. Norman Taylor, in his *Flora of the Vicinity of New York*, reported it (under the name *P. plenipilum*): "rare as a wild plant at The New York Botanical Garden, unknown elsewhere" in the local range. The variety is not recognized in The New Illustrated Flora. It is unqualifiedly submerged in the species *P. laeve*, described as having sheaths varying from glabrous to densely villous. On the contrary, the variety, as observed in the grounds, is consistently villous; but variation in the sense of the Flora may refer to different races represented in the general wide distribution of the species.

For contrast with the *Paspalum*, two other grasses might be sought anytime between June and September, the first in dry rocky grounds in the hemlock forest and the second in very wet soil in the north meadows. *Danthonia compressa*, wild oat grass, caespitose and slender-leaved (the old dried leaves beneath the fresh pale green of the new growth) has but a few spikelets in a sparse panicle. The culms are usually reddish above the nodes; the cushion at the joints is often higher on one side. The glumes (empty bracts at the base of the spikelet) are as long as the entire spikelet, consisting of about six florets. The lemmas (lower bracts enclosing the flower) are villous on the back and long awned (bristled) between two setaceous teeth at the summit. The awn is twisted at the base (clockwise in the specimens examined); as in other contorted awns, it rapidly untwists and straightens when wet.

Glyceria striata, fowl meadow grass, is not common in the Garden. It has a lax, delicately drooping panicle of tiny spikelets. How attractive is the buoyant, relaxed grace of this inflorescence! The slender curving branches are scabridulous. The lemmas are sharply striate-nerved, greenish or purplish; the smooth grains are smoky-olivaceous.

Agrostemma Githago, corn cockle, is found sporadically, probably introduced with the building of the new parkway. The corolla is purple or pink, lined with dark dots; it is nestled in a calyx from which radiate long foliaceous lobes. The five styles, papillose introrsely, on the back are covered with minute spicules, needle-like white hairs that are easily detached.

Potentilla argentea, silvery cinquefoil, was seen near the tool house, in bloom as early as the middle of May. The five, sometimes seven or three, leaflets are silvery tomentose beneath. Like other species of *Potentilla*, the calyx has appendages alternating with the five sepals; these are called the epicalyx and are represented as stipular. The stamens are of three sizes; those opposite the petals are long, those opposite the sepals are short, and the stamens placed in between are of medium lengths.

Aralia racemosa is a strikingly handsome plant, especially when displaying its great clusters of dark purple berries. The large leaves are ternately to quinately compound, with the division again cleft or pinnately lobed. The leaflets are cordate-ovate, doubly serrate. The bruised plant is spicily fragrant. The numerous rounded umbels are in large racemose-panicles. The fruits are longitudinally striate, the fine penciling becoming fainter as the small pungent berries develop. This spikenard is used as a stimulant and diaphoretic, as is *A. nudicaulis*, mentioned in the May-June issue of The Garden Journal.

Heracleum lanatum is a giant white-flowered member of the Umbelliferae. The outer flowers of the huge umbels are asymmetrical and their petals are two-cleft; the petals pointing away from the center of the umbel are longer than the inner ones. In the central flowers, the petals are of about equal size and not lobed. The disk-like stylopodium is pale yellowish white and crenulate. The pedicels are puberulous on the upper side. The species was not recorded in the list of wild plants in the grounds published in 1898. The cow-parsnip is one of the boldest, most conspicuous herbs in the northern part of the Park along the Bronx River, and it has been established for at least a quarter of a century. If present at

(Continued on page 119)

John Jeffrey

PLANT PILGRIM OF THE NORTHWEST

By **Grace T. Dowling**

It is quite possible that the soul of a scientist was born in John Jeffrey as it was in Linnaeus, with the considerable difference that Linnaeus was able to achieve his conceptions. Poor Jeffrey, unable through circumstances and, perhaps, through lack of encouragement and understanding, fell far short of a possible goal.

John Jeffrey was born November 14, 1826, in Perthshire, strangely enough in the same part of Scotland where Menzies and Douglas had lived. In 1849, a vigorous and industrious young man, he became a gardener at the Edinburgh Botanic Garden. Jeffrey, as well as Linnaeus, loved the natural growth around him and, in addition to his assigned tasks as gardener, he compiled an herbarium of the wild plants growing outside the area of the garden. For this he won a prize which brought him abruptly and unexpectedly to the notice of those Scottish landowners who had become interested in all new botanical materials from North America. Conifers, especially, were in vogue at the time and a group of Scottish lairds, gardeners, and botanists formed the Oregon Botanical Association. Many eminent growers headed the list of sponsors, among them the Prince Consort, John Hutton Balfour, Professor of Botany at Edinburgh University and Regius Keeper of the Royal Botanic Gardens, as well as Queen's Botanist for Scotland, Lord Glenalmond, and James McNabb, the head gardener at the Edinburgh Botanic Garden.

Because Douglas and Menzies had brought such a wealth of material from North America, it was the consensus of opinion that much more could be discovered if someone could be found to search the northwest country with the sole purpose of collecting. Douglas and Menzies, attached to early expeditions of discovery, were physicians as well as naturalists and as such could give only part of their time to collecting.

John Jeffrey seemed ready-made for the post. He was to search for new material in those regions in western North America where Douglas and Menzies had been. Seeds of all kinds, but more especially seeds of conifers, were desired to be divided among the contributors in the association. He was elected for three years.

On June 6, 1850, he sailed on a Hudson's Bay Company ship, "Prince of Wales." In the winter of 1850 he arrived at Lake Winnipeg, and in January 1851 he started on a snow-shoe trip of twelve hundred miles, stopping along the way at Hudson's Bay posts. The life of all explorers and botanical collectors is hazardous but John Jeffrey, only twenty-four years old when he left home, had no experience with hardships and most of the time traveled alone. In a letter received by Mr. Balfour, dated April 17, 1851, he said, "I continued to trudge on from post to post, getting a fresh man and fresh dogs at every post that I came to enroute. I generally remained at each station for a few days to refresh for another stage. During this journey I slept with no other covering than that found under the friendly pine, for the space of forty-seven nights, on several occasions the thermometer standing from 30° to 40° below zero. I find no bad effects from exposure, the only thing that happened to me was that once or twice I got slightly frost bit. That was nothing uncommon amongst us and little cared for."

There was little opportunity to send letters and collected seed. The only means of sending mail was through "The Packet," a group of traders who went from post to post carrying mail bags, et cetera. To avoid the danger of attack by occasional Indian tribes, Jeffrey joined one of these "Packets" and trudged over the Rocky Mountains to Vancouver Island, on the Pacific coast. As no journal nor record has been found, the meager accounts of his journeys are inadequate to show an accurate record of his travels. From infrequent letters, from notes in the boxes of seeds he sent back to Scotland, and from persons he met here and there in his travels, a sketchy chronicle of his wanderings has been made.

At Fort Hope, in Canada, he found *Penstemon Menziesii* and *Pinus albicaulis,* the white bark, sprawly pine found at timber line on most of the mountains in the Northwest. He collected *Erigeron uniflora* at an altitude of seven thousand feet, east of the Fraser River. It was in this vicinity he discovered the so-called *Pinus amabilis* that Douglas found on the Columbia River and named. This illusory "lovely pine" confused Jeffrey as well as many botanists following him. Not until 1880 was it rightfully named *Abies amabilis,* the "lovely fir." Also, near here, he found the western hemlock, *Tsuga heterophylla,* and the red-flowered gooseberry, *Ribes Lobbii,* introducing them both to Great Britain. He stopped at Fort Victoria on Vancouver Island and from there visited Mt. Baker in May, perhaps the first wayfarer to reach the snow line.

About this time he joined a famous British Columbia trail finder, Trader Alexander Caulfield Anderson, and from him and his son, John R. Anderson, a little information about the journeyings of Jeffrey has been acquired. John Anderson became a famous botanist and writer, living until 1930. He and Jeffrey botanized extensively around Victoria, B. C. Here Jeffrey spent a winter preparing and packing seeds to send back to Scotland.

Still searching for conifers, coveted by his sponsors, he wandered through Washington and Oregon. He found the beautiful lily the "forty-niners" had named 'Lady Washington' for the first President's wife. He discovered and introduced *Dodecatheon Jeffreyi,* the familiar shooting-star.

Crossing the Klamath Valley, he came to the California border, Mount Shasta, and *Pinus Balfouriana,* the

fox-tail pine, which he named for his patron. Here he also found *Pinus Jeffreyi*, a magnificent tree often confused with *P. ponderosa*. Mr. Sudworth, in his *Forest Trees of the Pacific Slope*, says the foliage of *P. Jeffreyi* "is heavier, more dense and a distinctly dark blue-green."

The winter of 1852 and 1853, Jeffrey spent at Hudson's Bay Post at Fort Vancouver (in what is now Washington State), where he packed his seeds. One box contained specimens of gold found on Queen Charlotte Islands. This was mailed at San Francisco and, in spite of the gold, the box was so small that the Oregon Botanical Association was extremely disappointed. The members had been dissatisfied with former returns from the expedition, but this box especially exasperated them. It had been sent collect and was said to have postage amounting to one hundred thirty-five pounds ($670). However, this was refunded by the postal authorities. He had drawn upon the Association in 1853 for two hundred pounds, but no one in Scotland was able to locate him. A letter dated San Francisco from W. Murray (a brother of Andrew Murray, secretary of the Association) said, quoting people who knew John Jeffrey, "he is a hard-working, enthusiastic, very steady and temperate man. He has been some weeks sick, which accounts for his long stay in San Francisco."

From San Francisco he started for San Diego, and the last communication was from Fort Yuma, which stated he intended to collect in that vicinity until fall.

Many conjectures have been made about his strange disappearance. There is one story that he was murdered by Mexicans in order to obtain possession of his pack mules and modest equipment. It is possible he may have died from exhaustion and thirst in the Arizona desert.

Andrew Murray, one of the secretaries of the Oregon Association, wrote, "Some subscribers to the Association remembering only that the third and last year of Jeffrey's engagement terminated unsuccessfully, and that they had just reason to be dissatisfied with his conduct during that year, sometimes speak of his expedition as a failure, but it is unjust so to term it, and if they would only remember the quantities of novelties which were discovered and introduced through his means, they would rather treat it as a great success, which only assumes the aspect of a partial failure from the knowledge that, great as it was, it ought to have been, and might have been greater still. No one could have worked more conscientiously and more perseveringly than Jeffrey did during the first two years of his employment, and bearing in mind that Menzies and Douglas went to a virgin country, his collections do him no discredit, even as compared to theirs." Jeffrey's friend Anderson wrote of him in 1872 in a government prize essay, "Poor Jeffrey, after wandering, sometimes in company of the writer, through a considerable portion of British Columbia and braving all its fabulous dangers, met his fate in New Mexico in 1853."

It is disappointing not to know more of this intrepid, young, migrant pilgrim. Frederick V. Colville, writing in the "Proceedings" of the Biological Society of Washington, tells of "one very rare pamphlet issued in 1853 which describes John Jeffrey and ten other pamphlets, not generally known, regarding John Jeffrey which were in the library of Sir Isaac B. Balfour of Edinburgh." Dr. McQueen Cowan of the Edinburgh Botanical Garden assured the writer of this article in 1952 that there are no papers or pamphlets concerning John Jeffrey that have not been found.

In an herbarium in the Royal Botanic Garden in Edinburgh is still preserved the dried collection of Jeffrey's specimens he sent home. The items number considerably over four hundred, each labeled with the date collected and the location where they were found. Often there is a little note describing in detail the soil and the special location where the tree or plant was discovered.

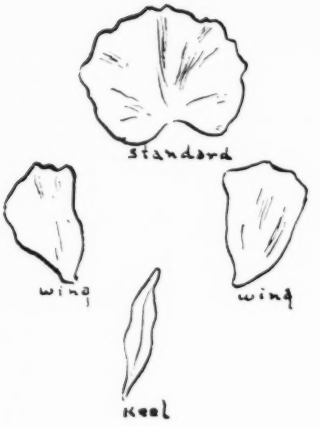
WILD FLOWERS (from page 117)

the time, it seems unthinkable that it was overlooked by Dr. Britton, Mr. Nash, and others when the list of wild plants was prepared for the Bulletin. If introduced since, then the curious problem arises of when and how.

Bartram first named the species *H. maximum* and noted its great height and spread and expansive umbels of snow-white flowers. Bartram's name has priority, but there is a question whether the names used by him are legitimate, as some claim he did not consistently follow the Linnean system of binary nomenclature. For arguments against the acceptance of Bartram's earlier binominal see Rickett in Rhodora (1944); for arguments in favor, see Merrill in Bartonia (1945). *H. lanatum* was reported as a sacred ceremonial plant of the Blackfoot Indians, and thus the name "sacred rhubarb." The succulent young shoots were eaten after roasting. A few plants of the Eurasian *H. Sphondylium*, distinguished by its pinnate leaves, still persist on the east side of the Bronx River near the bridge north of the meadows. They are growing together with *H. lanatum*, and the two species can be compared in the living state.

Convolvulus sepium twines from left to right; the fibers in the stem are twisted spirally, as though the stem had been subjected to torsion. The leaves are cordate, with a suggestion of hastate. Two foliaceous bracts are inserted slightly below the calyx, and they conceal most of the sepals. The funnel-shaped corolla is roseate or lavender and is marked with narrow white triangles. When the flower is observed from the top, the white bands form a five-rayed star. Roseate or white correspond to the parts that were covered or exposed while the blossom was still in bud. The depth of the corolla-tube is lemon-yellow, the disk around the base of the ovary is orange. There is a pit below each filament. The two lobes of the white stigma are composed of numerous papillose mammillae. In bud the corolla of the hedge bindweed has an amazingly intricate arrangement. It is plaited and the folds are convolute, their margins overlapping to the right; in addition, the corolla is contorted, the torsion being to the left.

PETALS *to* PISTILS



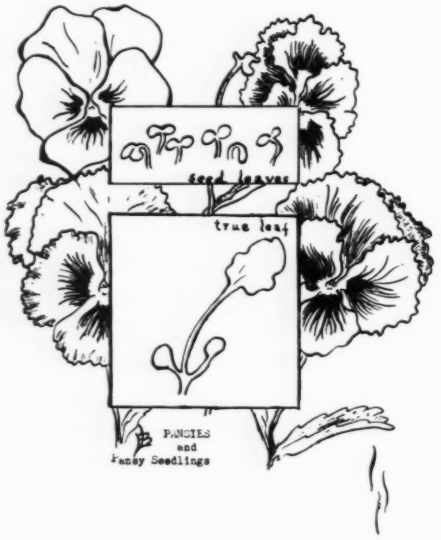
FOR THE YOUNGER GENERATION OF GARDENERS

PART I — Petals

By **Elise Ludlum Bowles**

IN my garden grow pansies, roses, and tulips, daylilies, hollyhocks, and petunias, also morning-glories and many other flowers. It is fun to watch them grow, especially those I start from seed. I put the seed in the soil, cover it up, then wait impatiently for the first little green seed-leaves to push up out of the earth. After that I watch for the true leaves to appear. Usually, they do not look a bit like the little seed-leaves that came first. Have you ever noticed that? Soon more and more leaves grow. Each kind of plant has its own way of growing and its own kind of leaves and stems. Some grow bushy and some, like the morning-glories, must climb to be happy.

It is all very interesting, but the most interesting things of all are the flowers. Sometimes, I go out in the snow to peek under the glass where my pansy plants are growing, just to see if any flower buds have formed yet. When spring comes I watch for the crocus flowers, the grape-hyacinths, and the daffodils. Then that wonderful day comes when the first big blazing orange-red poppy bursts into bloom. I know a young man, eight years old, who gets terribly excited when he spies a flower bud growing on his 'Heavenly Blue' morning-glory vines. It is wonderful to have lots of flowers outdoors in the garden. It is rather nice to have them in the house, too, especially on the dining-room table.

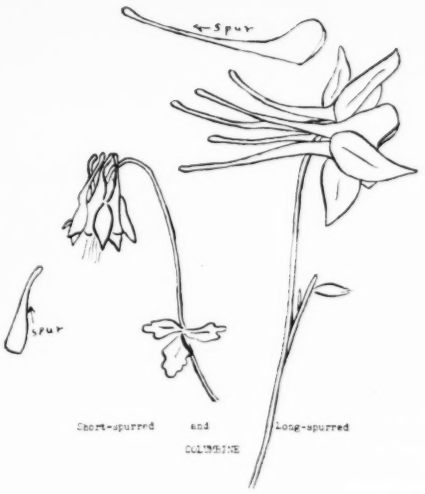


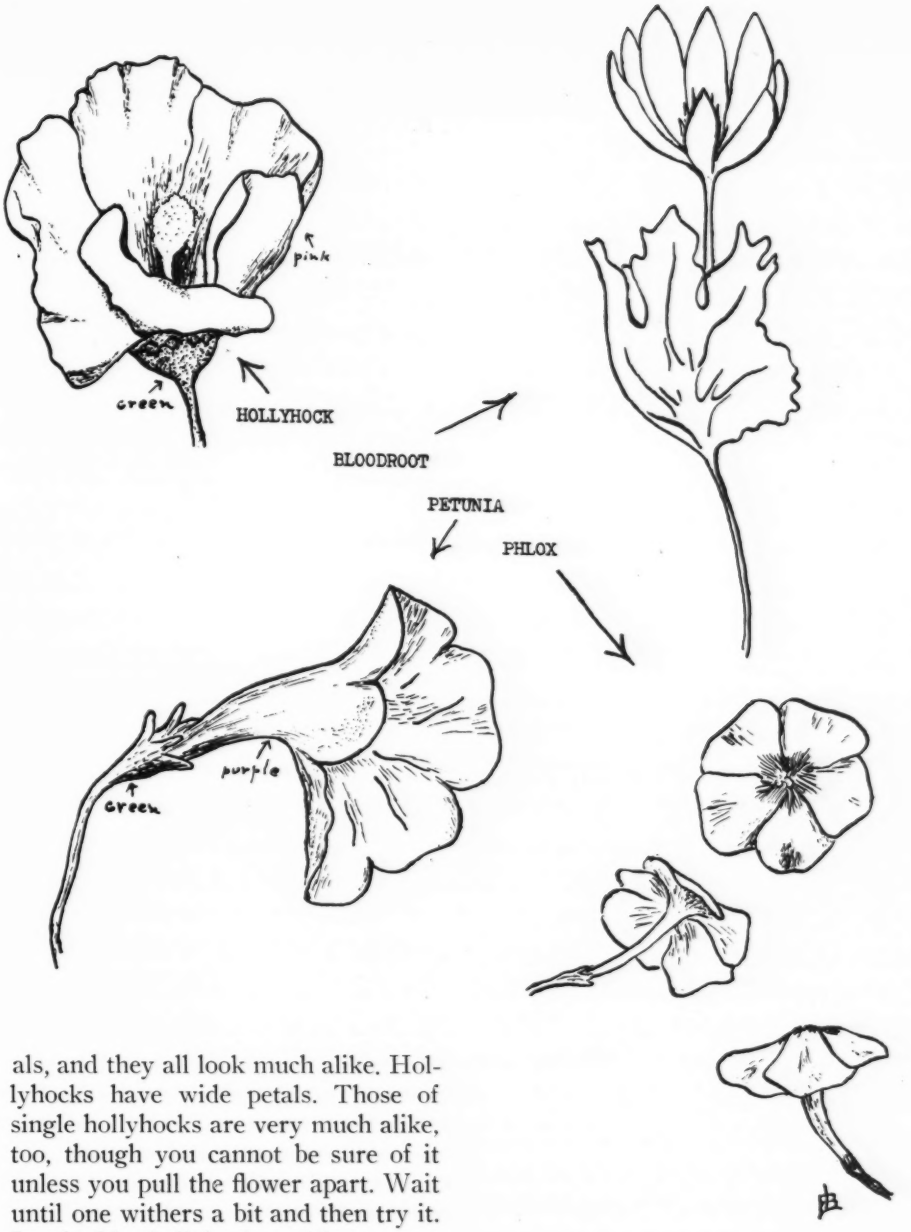
If I were to ask you what color my pansies are, you would probably say something like this. Some are purple, some yellow, some blue, and some even are red. I have a hollyhock flower in a glass of water on the table in front of me. What color do you suppose it is? I am sure you will guess it is pink. It is, too. The next time you see a hollyhock look at it closely. This one I have is not all pink. Part of the flower is just as green as the leaves. The center of the flower is a creamy white. But the petals are the most conspicuous part of the flower. They are usually bigger than the other parts. Therefore, if the petals of a hollyhock or a rose are pink, we say the flower is pink. The same is true of a pansy or violet or petunia. Whatever color the petals are, that is the color we call the flower.

It is interesting to count the number of petals a flower has. Pansies and violets have five petals. If you pick fifty pansies or even a hundred, you will find that every pansy has five petals. It is the same with violets. Just try it when the violets bloom in the field next spring. Those yellow flowers we call California poppies have four petals; so do sweet alyssum.

But roses or peonies sometimes have only five petals and sometimes have a great many. Do you know the bloodroot flower? It blooms quite early in the spring, in gardens as well as in the woods. Its leaves are a very interesting shape. The flowers have quite narrow white petals. Sometimes there are only eight and sometimes there are as many as twelve. In fact, some folks say they have seen sixteen. But you have to count as soon as you see them, for the petals soon drop. Don't touch them as you count, because that might make the petals fall off.

Now look at a petunia or at the picture I have drawn. It looks as though the petunia had only one big petal with





five scallops around the edge. Really there are five petals all joined together at their lower edges to form a funnel. The scallops are the tops of the petals. By looking at these scallops, it is easy to tell where the petals are joined together. One of my seed catalogues has a picture of a petunia called 'Twinkles.' Right in the center is a white five-pointed star — one point for each petal.

Phlox flowers have the petals joined together in the same way. This part looks like a tube and is very narrow and small. The scallops or lobes, as they are called, are turned back and flattened so they look something like a saucer. In fact, most people think the scallops are the petals and do not know that part of each petal makes the tube under the scallops. Look carefully at all the flowers in the garden, and you will find others whose petals are joined at the lower edges, or look in a seed catalogue. Notice the pictures of morning-glories, Canterbury bells, and nicotianas.

Another thing you will notice, as you look carefully at many different flowers, is how different in shape the petals of the different kinds of flowers are. The petals of a rose do not look at all like the petals of a lily. Look in a florist's window the next chance you get, and notice all the flowers there and the shapes of their petals. Snapdragons and geraniums are very, very different. But if you see poinsettias in the florist's window, don't let them fool you. What you take to be red petals on the poinsettias are not petals at all. They are bracts! Some day, I shall tell you all about them.

A blood-root flower has narrow petals, and they all look much alike. Hollyhocks have wide petals. Those of single hollyhocks are very much alike, too, though you cannot be sure of it unless you pull the flower apart. Wait until one withers a bit and then try it. In double hollyhocks with a great many petals, the petals in the center of the flower are quite narrow. The petals of a violet or a sweet pea are not alike. Those of a single sweet pea flower are so different they are called by special names. The top one is called the standard, the two at the bottom are joined together to form the keel, and the two side petals are called wings. I guess the keel is called that, because it looks something like the bottom of a boat. Peas, beans, lima beans, wisteria, clover, and many other plants have flowers whose petals are shaped like those of the sweet pea. The flowers of the locust tree are also the same shape.

It may surprise you to learn that a clover is not just one flower. In one clover are many flowers each with a standard, a keel, and two wings, just as in the sweet pea. It is easiest to see this on the big red clover that grows in the fields. However, the little white clover that grows among the grasses of our lawns, the yellow or hop clover that you sometimes see along the roadsides, and the fuzzy rabbit-foot clover that likes poor soil are all made on the same pattern. The red and white clovers begin to bloom in May, the yellow clover in June, and the rabbit-foot clover in August. You can have fun looking for all of them.

There is one kind of petal that I want to tell you about — that is the petal that has a spur. This is a narrow tube closed at the bottom. It holds

nectar inside. Nectar is sweetened water. Bees, butterflies, and other insects are very fond of it. So are humming-birds. They will work hard to get a bit of it. Each kind of flower hides its nectar in a special place. A spur is just one of many hiding places. If you look under the lower petal of a pansy or a violet, you will see what a spur looks like. All five petals of a columbine are spurred. Some columbines have longer spurs than others.

There are many flowers with odd-shaped petals, such as lady's slippers, snapdragons, and bleeding-heart. Some flowers have no petals at all, strange as that may seem.

Before I tell you anything more about flowers, I want you to understand that you can see almost everything I mention by just looking at the flowers where they are growing. Please do not pick the flowers, unless there are many flowers just like them all around. Remember, other folks like to look at them, too. If you leave them, they can. If you pick them, they cannot.

This completes first section. Sections on *sepals, stamens,* and *pistils* follow. — The Editor

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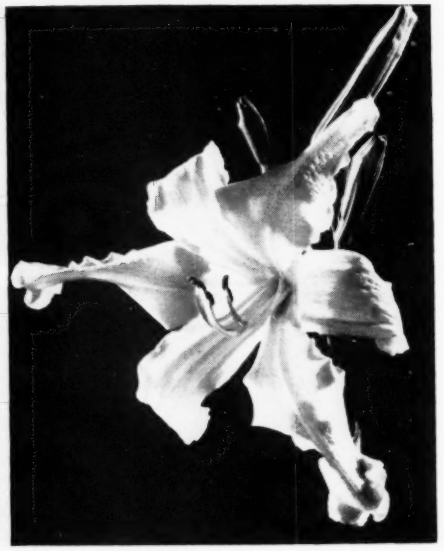
DAYLILIES (from page 112)

and more and more. Instead, I shall be very choosy. Right now, I'm looking for a little yellow daylily as floriferous and long blooming as 'Port,' which for me is the best-doing clump in the garden. It *masses* its color, and I look down on it and see it all in a sheet of color. For the garden, this is better than the massive big flowers on tall stems which take the prizes on the show tables.

"Everybody to his own tastes" is what the proverbial old woman said when she kissed her cow. In a manner of speaking, that is what I do with the daylilies I have in Tallahassee, Florida. Our house there is a dark brownish cypress construction and, with nothing to conflict, the orange daylilies are the handsomest of all, the fulvous ones are fine, and the delicate pastels—'Su Lin,' for example—just seem namby pamby and washed out.

Now I find that I am fond of some of the daylilies all of the time, all of the daylilies — even 'Painted Lady' — some of the time, but not all of the daylilies all of the time. That last stipulation shuts the door of the hemerocallis world in my face.



'Golden Triangle' is coming to the fore among yellow daylilies

This would make me unhappy, except that I am so pleased to be back in the big, wide, beautiful horticultural world. Only yesterday my heart turned over, when I came suddenly on the 'Blue Mummy' pea in full bloom still in the flat where I planted it. What clear light greenish blue with a little pink glow in the flower's heart giving it an iridescence, what slender, stiff grace! It is the rare blue lathyrus from Thompson-Morgan, whose catalog says quaintly, "Sole and sufficient address, Ipswich, England." I was completely diverted from daylily seedling transplanting. Next year, I plan to grow this pea on a little tube of wire netting near 'Precious Treasure,' which will by that time produce six or eight scapes. Never before have I been so excited over hemerocallis!

GARDEN STRUCTURES (from page 113)

areas mean less definition between "indoor" and "outdoor" living. This feeling of closer integration has led to an entirely different concept of the design and use of so-called "garden" furniture and accessories.

Wrought iron, light metals, thinner, lighter wood members in furniture create furnishings with a flexibility of use. So, too, do living spaces acquire a greater flexibility of use. Today's concept of outdoor living space is to create an extra room, or series of rooms, outside the house, whose functions are much the same as the living spaces under the house roof, but with the added feature of being naturally air conditioned, and without the traditional confinement of "four walls, and a roof."

The "walls" of these new living spaces range from complete, solid enclosure such as walls or vision-excluding fences, to mere suggestions of enclosure, in the form of a few well placed trees or shrubs.

The most important of these outdoor living spaces is that which provides facilities for sitting, entertaining, and dining under the sky. Its floor usually consists of some permanent paving material, which avoids the costly maintenance a lawn requires under heavy use. The "walls" may take the form of a partial enclosure, the wall of the garage or carport cutting off close view from neighbors, other walls becoming sitting walls finished off in wood to provide a more pleasant sitting surface. Tables and chairs are light in weight, colorful in design and fabric, and may be used either inside the home or without. Cooking facilities can readily be provided in the form of a portable charcoal grill. Ah, but this kind of a gadget precludes the pleasure of building a wood fire, which is so pleasant in the evening after an outdoor meal. Not by any means. Many firms construct iron grills of sufficient weight to be used for this purpose. However, the warm, red glow of charcoal shouldn't be completely denied as an amenity, which it provides without the sometimes acrid smoke from smouldering wood, that always follows me no matter on which side of the campfire I stand!

The illustrations accompanying this article admittedly are overly simplified, since they fail to show the great variety of colorful plants and flowering shrubs and trees that are available and so lavishly used in home ground development. These were deliberately excluded, to illustrate basic forms only, the room without pictures on the wall, so to speak. With the basic forms indicated, imagination can readily supply the decoration of the well-furnished outdoor living space. Note, too, that the house plan is a very simple one, such a floor plan as would be found in the popular "Cape Cod Cottage," and illustrates that integrated indoor-outdoor living can be adapted to fit almost any home.

BOOK REVIEWS

THE CITY OF Man. Christopher Tunnard. 424 pages, illustrated, indexed, bibliography. Charles Scribner's Sons, New York. 1953. $8.50.

Christopher Tunnard has written of as many aspects of the city as one volume could encompass. The book is in four parts, as follows: In Search of a City, Tradition and Experiment, Modern Civic Art, and An Approach to Civic Design. Abundant illustrations, informative in themselves, point up the text. No better expression of the purpose of the book can be made than is in Tunnard's words, "A better understanding of the city and forces that are now shaping it should enable us to foresee possible future development and channel it into a constructive pattern."

In the wealth of information, observation and opinion presented, there is a reward for almost any reader. To single out a few points: For understanding of the city, we must first look hard and well at the past — both to recognize and to avoid mistakes, and seize upon the good and lovely. Americans have persisted in a desire to be different, in a worship of cleanness of line, to the extent that they have often brushed aside traditional forms at the expense of total beauty. Of particular interest to horticulturists are the descriptions of the "romantic suburbs" of which Llewellyn Park was the first. And for New Yorkers, there is a brief report on the miracle of planning, Central Park.

What of the future? Tunnard describes the ideal as "creative cordonism." To achieve this, the natural and the social scientist and the architect will pool their skills, and practical solutions will become a better fusion of form and function of the practice and esthetic. *The City of Man* points the way.

JAMES C. MACKENZIE, *Architect,*
New York, N. Y.

HISTORY OF THE ROSE. Roy E. Shepherd. 264 pages, illustrated, indexed. Macmillan, New York. 1954. $4.75.

Roy E. Shepherd is exceptionally qualified to write this book. He has known the rose from boyhood and has had long experience as a rose collector, grower, hybridizer, and judge at rose shows. He is also a thoroughgoing student of the history of roses, their origins and varieties. For over twenty-five years, he has been a collector of rose species and varieties. At its height, his garden contained five thousand varieties, one of the largest existing collections. Even the famous Roseraie de l'Hay at Sceaux on the outskirts of Paris has now only about one half of M. Gravereux's original collection of eight thousand species and varieties.

I am informed that Mr. Shepherd has spent over forty years in rose research and has, for many years, had the use of the extensive library of rare books on roses of David B. Watson of Detroit.

Mr. Shepherd is, of course, well known as a director and officer of the American Rose Society. He has also been Chairman of its Old Rose Committee. He is one of a three-man committee to represent the American Rose Society in the design and management of the Columbus Park of Roses which was opened last year. To this project he has added the distinction of the gift of a large part of his own collection of species and old roses. He has originated four varieties of garden roses which are in commerce, and he expects to add an additional six originations this year. Mr. Shepherd's unique qualifications in dealing with the subject of rose varieties are the result of his long experience with roses of all types in his own extraordinary collection. He has taken care of them, watched over them, and learned their characteristics, habits and idiosyncracies. The product of his labor and knowledge is a book the like of which, in my opinion, could not have been written by any other rose authority I know or know about.

The classification of rose species of Dr. Crépin, formerly Director of the Brussels Botanical Garden, which, with later modifications, has generally been adopted in Europe, divides the rose genus into fifteen sections or types, comprising fifty-five species. Professor Bailey in his *Cyclopedia of Horticulture* approves a modification of Dr. Crépin's system. McFarland's *Modern Roses IV* (1953) adopts the classification of Professor Alfred Rehder of the Arnold Arboretum and lists about three hundred species. The recent Horticultural Cyclopedia of the Royal Horticultural Society states that there are about one hundred and twenty-five species. The classification of rose species is obviously complex and disputable, but Mr. Shepherd has adopted in substance Dr. Crépin's system and clears the way of much confusion by arranging his species into fourteen sections containing two or more related species under each section, with a total of about two hundred. He describes or has adequate reference to almost two thousand species and varieties. He emphasizes four Asiatic types, each represented by but one species and its varieties and forms. These four odd and fascinating roses include two which have become domesticated in the southeastern part of the United States, the Macartney rose *(R. bracteata)* and the Cherokee *(R. laevigata)*.

A chapter of predominating significance and absorbingly interesting is Chapter 5, "The French Rose and Its Relatives," the *Gallicanae* section. Here *Rosa gallica* receives its deserved tribute. Mr. Shepherd says: "The highly variable nature of *R. gallica*, the ease with which it hybridizes with other roses, and its wide natural distribution throughout Europe and western Asia make it easy to comprehend how mutation and hybridization have brought the origin of the several distinct groups." These derived groups include not only the Gallica species and hybrids, but the species and types of *R. centifolia, R. centifolia muscosa* (the moss rose), *R. damascena* and *R. alba*. Among species and subspecies, this is a glorious list. Actually, it is difficult to speak of the best parts of this book without including portions of every chapter.

The inquirer who has wandered into rose research may disagree as to the antiquity of *R. centifolia*, and he may not follow Mr. Shepherd into the by-paths where he argues from the possible to the probable. Nevertheless, Mr. Shepherd's method of argument is always based on his extraordinary knowledge of the essential characteristics of individual rose species and varieties. He is well acquainted not only with rose facts and their historical background, but with the discoveries of cytology and genetics. It is more stimulating and probably more helpful to speculate about possibilities than to refuse to go beyond the narrow limits of what is provable by definite evidence. In the case of *R. centifolia*, for example, there appears to be no accurate evidence that it existed before the sixteenth century, although it is possible that *R. centifolia* was seen by the ancient Greek, Theophrastus, who described the roses of his era as having from five to one hundred petals.

Mr. Shepherd states that all our garden roses owe much to the following eight species: *R. chinensis, R. damascena, R. foetida, R. gallica, R. moschata, R. multiflora, R. odorata, R. rugosa,* and *R. Wichuraiana*. This is the domain of investigation of many American, British, and European cytologists. They, too, emphasize that our modern garden roses were derived from a very meager percentage of rose species. Mr. Shepherd, like these scientists, hopes for great improvements in disease resistance, winter hardiness and general vigor, and beauty, if the chromosomes and genes of beneficent additional species roses are crossed with our best garden varieties. But it is impossible here to go into greater detail. Nevertheless, one should call particular attention to the final chapters of Mr. Shepherd's book on the origin, history, habit and future of the hybrid perpetuals, hybrid teas, hybrid polyanthas, and the so-called floribundas. One is bound to agree with Mr. Shepherd that many varieties have been originated and sold which it would have been wiser not to exploit, but, on the other hand, Mr. Shepherd is very fair to the best of the newer originations.

As to the hybrid polyanthas, he points out the confusion in classification and nomenclature and the need of crossing back to the dwarf polyanthas, if the polyantha strain is to be kept. This also is an area of great interest to everyone who hopes for the improvement of our strains of garden roses. Helter skelter hybridization should give way to intelligent, systematic efforts, as Mr. Shepherd urges. Parts of this book may be hard reading for impatient amateurs, but Mr. Shepherd scatters so much knowledge and understanding along the way that any intelligent reader would gain more from it than by reading any other book on rose species, varieties or origins.

EDWIN DE T. BECHTEL
Bedford Four Corners
Mt. Kisco, N. Y.

ROSES. Roy E. Shepherd. 96 pages, illustrated by Rebecca and Douglas Merrilees. Rinehart's Garden Library, W. W. Goodpasture, Gen. Ed. Rinehart, New York. 1954. $1.50.

This little book, durably bound for use, is by the same author as the *History of the Rose*, reviewed above. It is an admirable handbook for the beginner as well as for the experienced rose grower. Its chapters include: reasons for growing roses; soil, location and nutrition requirements; how to buy roses; the simplest method of planting; diseases and pests; pruning; winter protection, etc. Mr. Shepherd gives good cheer in insisting that roses are not too difficult to grow and briefly outlines the merits of classes and varieties. One can especially recommend the final chapter to all rose lovers, for here Mr. Shepherd describes concisely the methods of hybridizing, propagation by layering, cuttings and budding, and also the essentials of preparing specimens for rose shows. He even ventures into the controversial area of flower arrangement. I welcome

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The New York Botanical Garden
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with enthusiasm his plea for the preservation of old garden roses.

EDWIN DE T. BECHTEL
Bedford Four Corners
Mt. Kisco, N. Y.

THE SECRET OF THE GREEN THUMB. Henry T. & Rebecca T. Northen. 431 pages, illustrated, indexed. Ronald Press, New York. 1954. $5.

In this day and age, the "green thumb" in the garden is not self-operating nor divinely inspired, but is guided by a brain deeply instructed in the ways of nature, in the workings of life — biology.

No longer does the good gardener plant by the phases of the moon or the precepts of his ancestors, but he must know the elements of photosynthesis, transpiration, germination, nutrition, hormones, chromosomes, and evolution. To be at all aware of what makes plants grow means a college course in biology or much reading (and thinking) from college text books. Much now in print I do not pretend to understand, for the author supposes the readers are of his professional advancement, or else presents the biological information in "bedtime story" form, so elementary that most of the real information is omitted.

This book by the Northens is a definite text on plant biology, the work of trained scientists, but geared to high school level or the understanding of the home student. Not all the facts of plant life are fully explained, but we do find a simple introduction to the many phases of plant growth. Of the many attempts to give simply the background of the functions of living plants, this seems most complete and successful. It is suited for the gardener at night, and for members of garden clubs who ride their new hobby hard and insist on knowing why plants act and react as they do. It should be required reading (and discussion) for club meetings. The illustrations are many and well chosen.

STEPHEN F. HAMBLIN
Marstons Mills, Mass.

DAYLILIES AND HOW TO GROW THEM. Ben Arthur Davis. 149 pages, illustrated, indexed. Tupper & Love, Inc., Atlanta, Ga. 1954. $3.50.

This popular priced book on hemerocallis or daylilies advises what are the better daylilies and how to grow them. It will prove interesting and instructive to all daylily growers. A brief historical background is followed by chapters on "Dependability," "Propagation," "Soil," and "Culture." A useful variety list gives flowering sequences.

Five interesting chapters follow, appraising and discussing the behavior of daylilies in Florida, the Southwest, Pacific Northwest, Midwest, and Northeast. These analyses by well-known writers and growers explain why some evergreen varieties, when moved far north, sulk, and why some deciduous lilies won't grow in Florida. Dr. E. J. Kraus explains that the many variations of climate in the Northwest preclude overall recommendations, but that carefully selected varieties are available to suit varied growing conditions. In sections other than the unusual weather areas, both evergreen and deciduous varieties are satisfactory. As explained in the chapter on "Culture," daylilies respond to humus, fertilizer, and moisture with finer plants and flowers. Mulches are recommended, particularly in limited rainfall regions.

An interesting chapter discusses the use of daylilies as cut flowers and lists those staying open evenings. Prices of dependable varieties are given. The descriptions of the "1953 Popularity Poll" of the Hemerocallis Society is convenient information on the one hundred favorites selected.

Mr. Davis' warning about insects is timely, as thrips, red spiders, and slugs sometimes attack daylilies. Diseases are few. Injury from too deep planting and poor drainage is often overlooked and called disease.

F. EDGAR RICE
Bartlesville, Okla.

AMARYLLIS—AND HOW TO GROW THEM. Peggie Schulz. 128 pages, illustrated, indexed. M. Barrows, New York. 1954. $2.95.

Peggie Schulz is to be complimented on having written such a fine book on amaryllis. There is great need for this book, since amaryllis are becoming so popular again. Anyone who has grown them will realize at once that here is an author who has grown amaryllis in a window garden and has tested much of what she has written.

The book is written for the amateur and the professional grower alike, tending especially toward the window gardener. It is not dogmatic in demanding that certain rigid procedures must be followed, but gives a multiplicity of growing methods and allows the reader to make his own selections. It incorporates the best of the old and the latest of the new cultural methods.

The book covers some of the species, newer hybrids, soil formulas, general care, division, breeding, ailments, and most valuable for the collector, sources, with their addresses, both domestic and foreign. There is also a chapter on some of the close relatives of the amaryllis. There are many helpful illustrations and drawings to clarify further the already lucid text.

NICHOLAS T. URHAUSEN
Chicago, Ill.

INDOOR PLANTS AND GARDENS. Margaret E. Jones and H. F. Clark. (Edited by Patience Gray.) 154 pages, illustrated by Gordon Cullen; indexed. British Book Centre, New York. (Printed in Great Britain) 1954. $4.

If you are a house plant enthusiast, this book, written, compiled, and printed in England, should prove of interest to you. The introduction gives a splendid review of the cultivation of plants for rooms, a history of greenhouses, names of horticultural books, and various species used since the seventeenth century up to the present time.

The chapter on culture and choice of plants gives illustrative diagrams on placement of plants in respect to heat, with information on spraying, causes of plant decline plus treatment of same, pot sizes to use, soil formulas for plotting, propagation with and without soil, and a list of the best plants to use for the cutting method of propagation. It concludes with a bibliography.

The simplicity of the chapter on Species, which are given alphabetically, is especially valuable. In each case the definite needs are given, including light, position, temperature, watering, and soil. Hand-drawn black and white illustrations depict many of the plants described.

There are forty pages of elaborate photographic plates showing plant arrangements for both small and large areas, some suitable to the newer modern homes. The appendix includes a guide to placing of indoor plants, listing the following types: hardy plants for cool rooms; hardy plants for centrally heated rooms; tender plants for centrally heated rooms; plants for sunny rooms; plants for shady rooms; and flowering kinds. It lists also nurseries and florists where specimens may be obtained. This is followed by the bibliography and an alphabetical index.

A few color plates might have brightened the contents, and we in America probably use a larger variety of flowering plants in our homes; nor was there any mention of begonias, such favorites in this country.

GRACE B. MCCOLLOUGH
Glen Rock, N.J.

SONGBIRDS IN YOUR GARDEN. John K. Terres. 274 pages, illustrated, indexed. Thomas Y. Crowell, New York. 1953. $3.95.

Rarely are the charm of the informal essay, the humor of anecdote, and the read-

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ily accessible facts of the reference book contained between the covers of one book; but all of these qualities are delightfully set forth by Mr. Terres.

From many years' interest and experience, he describes in detail how to create the atmosphere that songbirds seek.

The text includes many easily interpreted sketches by H. B. Kane, accompanying the instructions for making feeders, shelters, and nesting boxes, which actual experience has shown to be adapted to the needs of various birds. Lists are included of favorite foods of different species, which will eliminate much of the trial and error of attracting birds. Trees, shrubs, and plants most valuable in the bird sanctuary are suggested for the planting plan.

In short, here is all the know-how any bird lover needs to establish a refuge in his own garden, of whatever size, with the multiple rewards that that brings. Mr. Terres' accounts of his observations of bird life offer all the incentive necessary to start his reader on a fascinating hobby. This book could furnish a course of study for an Audubon group or garden club, or make pleasant and rewarding reading in one's own library.

RUBY F. CHATFIELD
Whitehouse Station, N. J.

THE LIVES OF WILD BIRDS. Aertas A. Saunders. 256 pages, illustrated, indexed. Doubleday, Garden City, N. Y. 1954. $3.50.

This book is a pleasant combination of scientific and popular facts about birds.

Mr. Saunders begins in the same manner as the budding ornithologist with identification. He writes of learning about birds by the study of their color, size, shape, habits, posture, habitat, songs and calls; he makes helpful suggestions for keeping notes and records.

The chapter on migration dwells on the relative importance of such factors as the development of vegetation, weather conditions, the influence of light, and concludes that food is the most important cause in determining the migratory schedule.

He discusses the "Nesting Cycle" and writes that the nest is not a real home but a cradle with but one true purpose — reproduction. Many interesting thoughts about the incubation period, the care and feeding of the young, with a refutation of the theory of reasoning by birds, concludes the subject.

Mr. Saunders' ideas about bird behavior center around the struggle for existence, their play, individual differences and various means of escape from enemies.

The relation to their environment is depicted in chapters entitled, "Feathers," "Plumages and Colors," "Songs and Calls," "Food and Ecology."

The book ends with a strong plea for a wise conservation policy which omits "one sided" issues. "Do less killing and more observing of the wild life of birds."

ROBERTA S. FRANKLIN
Mountain Lakes, N. J.

COLOR IN FLOWER ARRANGEMENT. Adelaide B. Wilson. 128 pages, illustrations in color by Roche; indexed. M. Barrows, New York. 1954. $5.95.

As in her previous book, *Flower Arrangement for Churches*, Mrs. Wilson has given us an idea book aimed at solving specific problems.

Stressing that color, along with texture, is but an ornament to line and form and with them comprise the building materials of design, the author increases our "eye-power" for discovering sources in Nature of color combinations of interest to all flower enthusiasts.

The sixteen excellent color plates with detailed descriptions are grouped as a unit at the end of the book — a form, I feel, of particular help to those studying flower arranging seriously. Concentrating on the various chapters, one's attention is not suddenly distracted by a bright picture illustrative of points coming later in the text. It is a happy placement, too, of photographs planned in pairs: on one page "pictures" made of colorful birds, minerals, flowers, leaves, shells, lichens, or moths, and on the facing page an interpretation in flower composition or arrangement of the mood and coloring of each of Nature's gifts to us.

From a discussion of the language and theories, the importance of individuals making their own color charts with instructions, Mrs. Wilson develops for the reader a deeper understanding of many color harmonies, completing the book with lists of recommended reading for further study. Each of the fifty color themes for flower show classes listed herein is referred to a page in the text.

Once again the author's style is evocative of her own delightful personality.

DOROTHY W. LOGIE
Upper Montclair, N. J.

FLOWER ARRANGEMENT WORKBOOK #2. Myra J. Brooks. 64 pages, illustrated (photography by Roche); indexed. M. Barrows, New York. 1954. $2.50.

This book should be in the library of every novice flower arranger. The clear direct manner in which the lessons are presented, truly marks Mrs. Brooks as an excellent teacher. Her suggestion that the arranger "interpret" the suggestions in the lessons is sound advice, and will eventually lead the arranger to great satisfaction in self expression.

The chapters deal with every phase of flower arranging and home decoration which the average club woman or homemaker will need. In the suggestions for home decoration I particularly like the fact that the arrangements are not as studied and patterned as those for flower shows. There is a distinct difference between the two!

Also helpful to the novice is the minimum of text accompanying each picture in the lessons. The basic information is there and one does not need to sift it out of many paragraphs of needless description.

ELIZABETH J. HUYLER
Gladstone, N. J.

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HERBS FROM THE GARDEN TO THE TABLE. Dorothy Childs Hogner. 236 pages, illustrated by Nils Hogner, indexed. Oxford University Press, New York. 1953. $3.95.

Herbs From the Garden to the Table provides us for the first time with a convenient pocket-sized book for the beginner wishing to grow his or her own herbs.

On the front end-paper is a simple plan for the arrangement of the twenty-four herbs chosen.

The first part of the book gives descriptions of these herbs, much essential information about their nature and propagation. Throughout the book are clear-cut line drawings of each herb described to help in identification. The discussion of the relative merits of such essentials as manure and composts to build proper soil structure, fertilizers to supply any missing chemicals, and remedies to cure ills are brief, clear, and to the point.

The questions of when to gather the herbs, how to dry and store them for use singly or in combinations is answered for the beginner. There are many recipes with which to introduce the family to the joys of cooking with herbs. The flavor chart on the back and cover tells its story quickly and clearly.

In addition to the Hogners' twenty-four basic herbs, many others are described and pictured as one progresses in the book. I lament the absence of lemon verbena and pineapple sage, which to me stand high on any list of delightfully fragrant and useful herbs. Of course, any basic list would vary from one individual to another, just as I should prefer to nibble fennel seeds rather than dill through any lengthy sermon.

Any one contemplating entering the cottage herb industry will find the Hogners' experiences illuminating and helpful.

The bit of ancient lore and superstition placed beside the scientific concoctions of our own times gives us pause to wonder what the future may say of us.

From the opening descriptions of individual herbs to the listing of herb gardens worth visiting throughout the country, I find this book one of the most complete, well arranged, and useful of any of our recent books on the subject.

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PLANT BREEDING FOR EVERYONE. John Y. Beaty. 102 pages, illustrated, indexed. Charles T. Branford Co., Boston, Mass. 1954. $2.75.

Written by a former associate of Luther Burbank, this little book gives encouragement to anyone who would like to have a try at creating new plants. The technique of cross pollination is simply explained, and examples given. The value of good parentage and keeping a record of crosses is properly emphasized.

Many seedlings of good parents may not be worth perpetuating, but there is always the chance of getting a winner, and that makes plant breeding a fascinating subject.

Numerous garden plants of value have arisen either as mutants or chance seedlings. The author encourages one to keep a sharp eye out for variations of distinctive value.

HENRY E. DOWNER, *Horticulturist*
Vassar College
Poughkeepsie, N. Y.

PLANT GROWTH SUBSTANCES. L. J. Audus. 465 pages, illustrated, indexed. Interscience Publishers, New York. 1953. (Printed in Great Britain.) $6.50.

This is perhaps the most comprehensive book on plant growth stimulators and inhibitors yet to be published. Most of it is a bit too technical for amateur gardeners but it should prove invaluable to students and teachers of plant growth substances. The four appendices are probably of greatest immediate use to practicing gardeners. The first lists plants that are easy to root as well as those hard to root, together with the appropriate rooting hormone for each plant. Two other appendices list the hormone concentrations required in the fruit-set of tomatoes and in the production of seedless fruits in species other than tomato. The fourth appendix lists nearly one thousand weed, crop and ornamental plants and their sensitivity to treatment with hormone herbicides.

P. P. PIRONE

COCOA. CULTIVATION, PROCESSING, ANALYSIS. Economic Crops Series, Vol. III. Eileen M. Chatt. 302 pages, illustrated, indexed. Interscience Publishers, New York. 1953. $8.50.

This volume on cocoa is a highly creditable addition to the books in the Economic Crops Series, being published under the editorship of Z. I. Kertesz. The author, Eileen M. Chatt, of the British Food Manufacturing Industries Research Association, has written a monographic treatment. As such, the facts are presented concisely with well-chosen, authoritative references for the various phases of the subject. It covers all main divisions *from* the historical and current limitations of the use of the word cacao versus cocoa *through* the botanical and agricultural facts and procedures for the cultivation and production of the crop *to* the utilization in the cocoa and chocolate industry.

Although written primarily for the agriculturist and the manufacturer of chocolate liquor and its industrial products, the monographic nature of the book also includes the historical, botanical, and economic data with its significance as a human food. This broad approach causes the book to be of cultural as well as technological value. The detailed story is most interesting of this native American plant species, named in 1720 by Linnaeus *Theobroma Cacao*, which has become a major economic factor in world commerce; is the most nutritious of all plant beverages; and, is the No. 1 flavor of the United States which consumes over five pounds per capita per annum, totaling over forty percent of the world production.

The concise, clearly-stated material on the multiple phases of the subject is enhanced by informative tables and figures.

Perhaps the weakest section of the book, academically, is the brief handling of the leaf function and photosynthetic changes. In contrast, however, the treatment of the chemical changes in the unfermented and fermented bean have more than offset the deficiency in the presentation of the leaf physiology. In fact, the major contribution of this excellent monograph, in comparison with previous volumes on cacao, is the concise and accurate discussion of a superior caliber from critically-selected sources regarding the pH and chemical changes in the bean. For example, cacao is the chief natural source of medicinal theobromine. The organization of the material on the Xanthine Bases, theobromine (but not theophylline) and caffeine, and their combination with catechin; and, the discussion of the tannins and pigments, particularly the anthocyanin glucosides of anthocyanidins, is based upon the evidence from chromatograms and structural formulas.

Excellent author and subject indices are given. This reviewer recommends this monograph on cocoa as an accurate and well-written compendium which serves its purpose effectively.

RALPH HOLT CHENEY
Professor of Biology
Brooklyn College

PLANT DISEASES. Ernst Gram and Anna Weber. (Edited and adapted by R. W. G. Dennis.) (Translated from the Danish by Evelyn Ramsden.) 618 pages, illustrated, indexed. Philosophical Library, New York. (Printed in Great Britain.) 1953. $18.50.

This comprehensive and impressive book on plant diseases was written by well-known plant pathologists for use by growers themselves. It contains a wealth of practical information and sound advice on how to handle disease problems. Published originally in Copenhagen in 1940, the book was so well received that a new edition was required in 1944. This second edition has now been translated into English, revised and adapted somewhat for conditions in England. The book is divided into five sections. The first deals with the nature of plant diseases (98 pp.), the second with diseases of trees and bush fruits (130 pp.), the third with diseases of vegetable and herbaceous fruits (176 pp.), the fourth with diseases of ornamental plants and trees (165 pp.), and the fifth with control measures (34 pp.).

Successful control of plant diseases requires accurate diagnosis, much of which the grower must learn to do for himself. To this end, section I is devoted to a general discussion of the nature of diseases in plants. A disease is defined as any deviation from normal development. Abnormal conditions usually regarded as diseases are those induced by infection with a parasite and thus transmissible to hitherto normal plants, or those due to unfavorable environmental factors. No attention is given to insect injuries nor to those caused by nematodes. Much information is given concerning disorders caused by shortage or excess of water, low and high temperature damage, light, wind and mechanical injuries, nutritional deficiencies and excesses, especially iron chlorosis, poisoning by gases, fumes, and other chemical injuries. Suggestions for controlling these forces in so far as possible are included. In this section, too, are described the symptoms and control measures for each of several diseases common to a great many different kinds of plants, among them Botrytis gray-mold, Verticillium wilt, powdery mildews, root-rots, bacterial crowngall, and the virus diseases.

Sections 2, 3 and 4 discuss the several diseases for each crop in the respective groups. Host plants are listed alphabetically in each section. Symptoms of each disease are described carefully, many are well illustrated, and the best known control measures are indicated. As an aid in diagnosis, keys are given to the diseases on the more common hosts. Coverage for most hosts is adequate. Thus, some ten pages are devoted to apple scab (50 pp. to apple diseases), 44 pages to potato diseases, 28 pages to tomato diseases, 15 pages to tulip diseases, 8 pages to rose diseases.

In the final section on plant disease control the importance of quarantine regulations are discussed, as well as seed and soil disinfection, sanitation, spraying, dusting, and fumigation. Chemical fungicides are listed and directions and purposes for the use of each are given, including their advantages and disadvantages. Unfortunately, many of the newer fungicides are given under European proprietary names which are not the same as those used in the United States.

The book is filled with good and accurate information on plant diseases, simply but effectively told. Although written for European conditions, most of the same disease

(Continued on page 131)

NEWS, NOTES and COMMENTS

"Romance of Tea." The history, romance, and art of tea drinking is graphically portrayed in the tea exhibit in the Museum Building of The New York Botanical Garden. The exhibit will continue until November 1.

The exhibit was arranged by the Display Committee of the Volunteer Associates of The New York Botanical Garden with the cooperation of the American Museum of Natural History, Brooklyn Museum, Cooper Union Museum for the Arts of Decoration, Metropolitan Museum of Art, Museum of Modern Art, Museum of the City of New York, Mystic (Conn.) Museum, the Newark (N. J.) Museum; and Avard, Inc., Alice Boney, J. A. Lloyd Hyde, Katzenbach & Warren, Sarah Hunter Kelly, La Vielle Russie, William Laurence, Thomas J. Lipton, Inc., Edward Little Tea, Elinor Merrill, The Chase National Bank, Tea Council, Mrs. Walter Douglas, Vladimir Reichel, Paramount Pictures, and Peasant Art Import Company.

The earliest history of tea is lost in Chinese antiquity. It will probably never be known exactly when the Chinese first infused tea leaves and made bitter tea—enchanting myths and fable give the date as 2737 B.C.—but it was during the sixth century that the Chinese discovered that tea could be more than a bitter medicinal drink. Other countries in Asia adopted tea—Java, Sumatra, India, Japan; in fact, in Japan tea drinking became an even greater art than in China and young men and women were specially trained in the intricate etiquette of the "Tea Ceremony."

Then, in 1610, tea was introduced by the Dutch into Europe, and fifty or sixty years later it was brought to the Massachusetts Bay Colony.

When New Amsterdam became New York in 1674, the city took on English manners and customs. Ladies went to parties carrying their tea cups and saucers of delicate china and their own teaspoons. Tea was served at special parties and at meal times; "afternoon tea," however, did not become a social custom until some years later.

Tea is closely identified with the history of the United States, for it was the tea act of 1773 that stirred up the famous Boston Tea Party, the subsequent events of which resulted in the birth of this republic.

The London "tea gardens" of the eighteenth century which brought tea out of doors in England, became very popular because women could attend. The "coffee houses" were strictly masculine. "Tea gardens" spread to Colonial America, and Vauxhall Garden was opened in Greenwich Street, New York City, in 1750. (Objects loaned for this miniature of a "tea garden" by Museum of the City of New York.)

In the three hundred years since the first pound of tea reached the Massachusetts Bay Colony, the use of this beverage has grown tremendously. In 1953 the United States consumed 103,000,000 pounds of tea or about 20,000,000,000 cups, of which 27,500,000 pounds were imported from Ceylon, India, Pakistan, and Indonesia. The United Kingdom consumes about 475,000,000 pounds annually, Canada 45,000,000, to say nothing of the tea consumption of Australia, New Zealand, and the Orient itself. Tea is big business, according to the Tea Council, which is also cooperating with The New York Botanical Garden in this interesting exhibit.

Tea drinking today reflects the Japanese influence. (Modern print from Museum of Modern Art, coffee table from Avard, Inc., Royal Berlin Urbine porcelain from Fraser's and primitive pottery jar from collection of Dr. Bassett Maguire.)

The tea plant, *Thea sinensis*, flourishes in tropical or subtropical areas. However, while the plant grows most luxuriantly in hot climates, the leaves from plants growing in the cooler altitudes of these countries, at 3,000 to 6,000 feet, produce the finest teas. Because the yield from these plants is smaller as well as of a better quality, these teas are rarer and more expensive. In Darjeeling, India, from which place comes the very fine tea "Darjeeling," noted for its strength, clarity, and dry bouquet, the tea gardens are located more than 6,000 feet high and face the snow-capped Himalaya Mountains.

Tea grows from sea level to 6,000 feet and in soils ranging from sand to clay. Though it flourishes in countries where the rainfall is heavy, it will not grow in swampy land. The tea gardens—or estates as they are called in South India and Ceylon—are carefully laid out, according to the contour of the land. Terraces are made to prevent soil erosion and trees are planted to serve as windbreaks and shade the tea plants.

A partial view of the exhibit, "The Romance of Tea" in the Museum Building of The New York Botanical Garden; open until November 1.

Spring Garden Tour. The Spring Garden Tour of The New York Botanical Garden on June 17 gave participants the opportunity to view outstanding gardens in lower Westchester County, known for their beautiful roses and displays of other late spring flowers.

The roses in the gardens of Mr. & Mrs. Edwin De T. Bechtel in Mt. Kisco, N. Y., are unexcelled for their culture and variety. The gardens are flanked by hemlock hedges and bounded along the northern edge by a long allee of peonies and lilacs. The main garden is planted with yews and a collection of hybrid tea, hybrid perpetual and hybrid polyantha roses. The adjoining

Looking toward the perennial borders from "Cross River House," the home of Mr. and Mrs. Paul Sturtevant, Katonah, N. Y.

hedge, stone wall, and open gardens are also planted with these roses as well as rugosa and musk hybrids. The early eighteenth century farmhouse overlooks the entire series of rose gardens with a patio in which a rose hedge, hemlock, and yews are featured.

Mr. & Mrs. Paul Sturtevant's home, "Cross River House," was built twenty-five years ago in Katonah and landscaped by Clarence Fowler. From the terrace there is a particularly beautiful vista across the lawn, which is bordered by masses of rhododendrons, through the trees to the water in the distance. "Cross River House" has a white garden, a lilac-walled rose garden, and a blue walk in a woodland setting.

"Caramoor," the home of Mrs. Walter T. Rosen in Bedford is a simply landscaped one hundred and fifty acres of lawns, gardens, fields and woods. The sunken rose garden, the long cedar walk, and the row of antique marble columns against dark green sycamores and firs are in keeping with the Italian villa. The residence is built around a courtyard of pink and white oleanders, ancient green bay-trees, and formal flower beds, and houses the art collection.

The home of Mrs. Charles D. Dickey in Bedford is appropriately named "Farview." There is a magnificent view from the east side of the English stucco house—across the tops of pruned apple trees—into the Bedford Hills. "Farview" features spacious lawns, formal rose gardens, and a perennial border. In pleasing contrast is the woodland path and bird sanctuary.

Flower arrangements gave a festive air to the Irish-Georgian period home of Mr. & Mrs. Arthur M. Anderson in Bedford. The grounds of "White Gates Farm," landscaped by Robert L. Fowler, are noted for their charming simplicity. "White Gates Farm" features a wide turfed allee bordered by very old apple trees. Of particular note are the rare old wisterias on the terrace, which were presented by the Royal Family of Japan.

Mrs. Percy L. Douglas and Mrs. John L. Senior, Jr., were chairmen of the Garden Tour sponsored by the Volunteer Associates of The New York Botanical Garden. Serving with them on the committee were Mrs. Arthur M. Anderson, Mr. and Mrs. Edwin De T. Bechtel, Mrs. James Cox Brady, Mrs. Charles D. Dickey, Mrs. John E. Lockwood, Mrs. Henry B. Roberts, Mrs. David Rockefeller, Mrs. Walter T. Rosen, Mrs. George C. Sharp, Mrs. Paul Sturtevant, Mrs. John G. Winchester.

Rose Day. The Twelfth Annual Rose Day at The New York Botanical Garden proved a memorable occasion. The Rose Garden was radiant with thousands of blooms; not in several years have visitors to Rose Day enjoyed such a spectacle of color. T. H. Everett, Horticulturist of The New York Botanical Garden, and his Committee of Guest Hosts conducted the visitors around the rose garden in the morning, then all lunched at the Lorillard Snuff Mill.

In the meantime, members of garden club affiliates of The New York Botanical Garden were busily engaged in making arrangements featuring roses in the Museum Building: Mrs. S. W. Rodda for the East Orange Garden Club, Mrs. Edward S. Gregory for the Garden Club of Lawrence, Mrs. Warren Kinney for the Morristown Garden Club, Miss Irene Gross for the Garden Circle of New Rochelle, and Mrs. Benjamin Moore for the North Country Garden Club of Long Island. Edward J. O'Keefe, Gardener at "Red Oaks," the estate of Mrs. M. Newborg at White Plains, N. Y., set up a most attractive exhibit of top-quality single roses—'Cecil,' 'Dainty Bess,' 'Innocence,' 'Irish Fireflame,' 'Isobelle,' 'Red Boy,' and 'Vesuvius.' This exhibit won the silver cup presented by Beatrix Farrand, noted landscape architect, to The New York Botanical Garden, to be awarded each year at Rose Day. Mr. O'Keefe was the first one to receive this cup, which he will retain in his possession for the coming year.

Bobbink & Atkins of Rutherford, N. J., displayed roses in variety. Included in their exhibit were 1955 rose introductions—'Jiminy Crickett,' a floribunda, 'Queen Elizabeth,' a grandiflora, and 'Tiffany,' a hybrid tea; a new red everblooming climber, as yet unnamed; and old roses including the moss rose and the hybrid perpetual 'Baroness Rothschild.' Jackson & Perkins of Newark, N. Y., showed 'Siren' and 'Golden Masterpiece.'

At the opening of the afternoon session, held in the Lecture Hall, Dr. William J. Robbins, Director of The New York Botanical Garden, expressed his pleasure in seeing so many old friends present for Rose Day, called attention to the changes in the vicinity of the Rose Garden, and announced that Mr. Everett would take over the rest of the program as "M.C." Mr. Everett then introduced Dr. Donald Wyman, Horticulturist of the Arnold Arboretum, the subject of whose talk was "Rose Species." Dr. Wyman said a more appropriate title would be "Wild Roses of the World," and added that his interest is in the wild rose. "Wild roses are plants that do not need nearly as much attention as do some of the hybrid teas and hybrid perpetuals. Also, they have certain characteristics that warrant their use in the planting about the home grounds. It is because of this that I think some of these wild roses are very important. I do not want to bore you with too much history—I shall guarantee not to mention more than twenty species—and each and every one of these species is obtainable from some nursery in the East—and each and every one of them has some value under certain conditions in some home gardens. Far be it from me to say that they are better than anything that you have seen in the wonderful rose garden here at The New York

A rose bed at the corner of the main garden in the gardens of Mr. and Mrs. Edwin De T. Bechtel in Bedford Four Corners, Mt. Kisco, N. Y.

Botanical Garden, because they are not. There are many roses in that garden that you people admire, and should admire, and many others admire them, too. These wild roses are the shrub types that will grow from three feet high to twelve feet or more. Do not think of all species roses as that little single pink rose that you saw in a New England cow pasture last summer! There are pink wild roses, but there are also 'super-dupers' that are deep red, yellow, and white. I shall now present to you a very few—just a very few—of the wild roses of the world." Dr. Wyman then showed excellent kodachromes of such rose species as *Rosa blanda, Rosa canina, Rosa damascena, Rosa Moyesii, Rosa rugosa, Rosa setigera, Rosa spinosissima,* and others.

Mr. Everett then introduced the guest hosts, Stephen G. Cutting, Head Gardener of "Fieldwood Farm," the estate of Mrs. John D. Rockefeller 3rd at Ossining, N. Y., Paul F. Frese, Editor of "Popular Gardening," Mrs. Dorothy Ebel Hansell, Editor of The Garden Journal, Everett A. Piester, Director, Department of Parks & Recreation of Hartford, Conn., Dr. P. P. Pirone, Plant Pathologist of The New York Botanical Garden, Mrs. Dorothea Bobbink (Mrs. George C.) White, Vice-President of Bobbink & Atkins, and Robert Eisenbrown, also of Bobbink & Atkins, who participated in the clinic on the culture of roses, insects and diseases that bother them, their use in garden and home. Mrs. Ruth E. (Mrs. Henry M.) Kistner, widely known author and lecturer on flower arrangements, gave a demonstration on making rose arrangements. Her lecture was the highlight of the day. While her hands deftly and gracefully arranged roses alone and combined them most effectively with applemint, with teucrium, and with other flowers in line and mass arrangements, she delivered some very stimulating, running comments.

Garden Club Day. April 26 was designated as Garden Club Day, when members of garden club affiliates of The New York Botanical Garden visited the Garden. They enjoyed a tour of the grounds in the "Floral Flyer," luncheon at the Lorillard Snuff Mill, and symposium held in the Assembly Room of the Snuff Mill. Mrs. Dorothy E. Hansell, Editor of The Garden Journal and in charge of garden club affiliates, welcomed the visitors on behalf of Dr. William J. Robbins, and called upon Dr. David D. Keck, Head Curator, to preside in the Director's absence. Dr. Richard M. Klein, Dr. P. P. Pirone, T. H. Everett, and Dr. Keck covered various aspects of The New York Botanical Garden—laboratory, plant pathology, horticulture, and plant exploration.

Annual Meeting of The New York Botanical Garden. At the annual meeting of The New York Botanical Garden held on May 20, 1954, in the Assembly Room of the Lorillard Snuff Mill, Sherman Baldwin was asked by Charles B. Harding, President, to present a memorial resolution for Colonel Marston T. Bogert, a member of the Board of Managers who had died on March 21, 1954. The resolution was ordered spread upon the minutes of the meeting and a copy sent to the family of Col. Bogert with the deep sympathy of the Board.

The following were elected to the Board of Managers to serve for three years: Arthur M. Anderson, Howard Bayne, Berkeley Gaynor, Charles B. Harding, Clarence McK. Lewis, Henry de la Montagne, Henry Parish, II, and William J. Robbins.

Above: Mrs. S. W. Rodda, East Orange Garden Club; Mrs. Edward S. Gregory, Garden Club of Lawrence; Mrs. Warren Kinney, Morristown Garden Club; Miss Irene Gross, Garden Circle of New Rochelle, and Mrs. Benjamin Moore, North Country Garden Club of Long Island, are busily engaged in making arrangements on Rose Day, June 10, 1954.

***Right:* Edward O'Keefe holds the Beatrix Farrand Silver Cup awarded to the exhibit of single roses from "Red Oaks"**

Eleven new corporate members were elected: Mrs. LeRoy Clark, Mrs. John W. Donaldson, Mrs. Inglis Frost, Mrs. William Kemble, Mrs. John E. Lockwood, Mrs. Robert A. Lovett, Mrs. Peter Malevsky-Malevitch, Mrs. Thomas W. Stevenson, Mrs. Ernest G. Vietor, Berkeley Gaynor, and Professor Frank J. Pokorny.

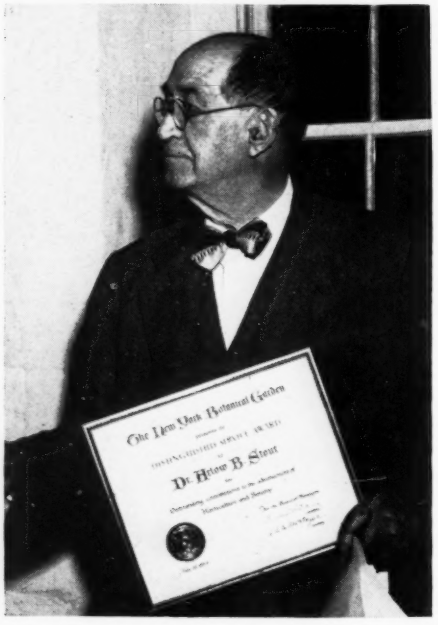
Distinguished Service Awards were presented to Dr. Arlow B. Stout for his investigations and accomplishments in plant breeding and in recognition of his singular ability to combine theoretical botany with plant improvement; and to Mr. John C. Wister for his services to horticulture.

Dr. Stout has been especially concerned with investigations on the flowering and pollination of the avocado. His studies of grapes resulted in a cooperative project with the Agricultural Experiment Station at Geneva, N. Y. His work on daylilies during the past forty years has yielded botanical information on their growth, flowering, chromosomes and heredity; a taxonomic monograph of all the species known in the world; and many new varieties. Dr. Stout also spent several summers in California, at the invitation of a large seed company, during which he developed methods for breeding petunias.

Mr. Wister, landscape architect, lecturer, and author, is recognized internationally as an authority on daffodils, iris, peonies, and lilacs. He has played an important part in American horticulture, having served, with distinction, the American Iris Society as one of its founders and as its first president, 1920-34; as secretary of the Pennsylvania Horticultural Society, 1928-1952; and the American Rose Society, the John Bartram Association, the American Association of Botanical Gardens and Arboretums, in one capacity or another.

John C. Wister's firm conviction that the smaller arboretums and botanical gardens must plant *only the best* is well illustrated in the plantings at the Arthur Hoyt Scott Horticultural Foundation, Swarthmore, Pa., of which he has been director since its establishment in 1930. The plantings in this arboretum and garden, and on the campus of Swarthmore College, are nationally recognized as outstanding.

Mrs. Hermann G. Place, Chairman of the Advisory Council, Mrs. James Cox Brady and Mrs. John G. Winchester, Co-Chairmen of the Volunteer Associates, presented reports. Mr. Harding presented the report of the President, Dr. William J. Robbins, the report of the Director. (All



Above: Charles B. Harding, President of The New York Botanical Garden, congratulates John C. Wister upon receiving the Distinguished Service Award

Above, right: Robert Moses, Commissioner of Parks of the City of New York, talks with Mrs. Harold I. Pratt, Chairman of the City Relations Committee of The New York Botanical Garden, at the conclusion of the dedication ceremony of the Lorillard Snuff Mill on April 10, 1954.

Left: Dr. Arlow B. Stout holds the Distinguished Service Award and accompanying citation presented to him by The New York Botanical Garden at its annual meeting on May 20, 1954

these reports have been mailed to the members of The New York Botanical Garden.)

Board of Managers. At the annual meeting of the Board of Managers, held on May 20, 1954, in the Assembly Room of the Lorillard Snuff Mill, Joseph R. Swan was elected Chairman of the Board for the ensuing year.

Other officers were elected as follows: President, Charles B. Harding; Vice President, Frederick S. Moseley, Jr.; Director, William J. Robbins; Treasurer, Berkeley Gaynor; Secretary, Assistant Director, Henry de la Montagne; Administrator, Business Manager, August C. Pfander; Assistant Secretary, Donald P. Rogers.

Dedication of the Snuff Mill. At the dedication of the Lorillard Snuff Mill on April 10, Charles B. Harding, President of The New York Botanical Garden, read the gracious letter he received from the First Lady of our Land: "I am most appreciative of the invitation to attend the dedication of the Snuff Mill at The New York Botanical Garden tomorrow afternoon. To my deep regret, previous commitments here in Washington have made it impossible for me to be with you.

"Please extend my sincere good wishes to all those present at the ceremony. I am sure that it will be a most delightful affair —particularly with all the spring flowers and blossoming trees adding to the color of the occasion. Mamie Doud Eisenhower."

A charming note of regret was received by Mrs. Hermann G. Place, Chairman of the Advisory Council, from Mrs. Thomas E. Dewey: "I did receive your nice letter of March 19, with its invitation for Saturday, April 10, and had so hoped to be able to be with you at the Snuff Mill Restaurant. It sounds like a delightful occasion, and I'm so sorry that it will not be possible for me to be in New York on that day.

"With all good wishes for a successful day, and with kindest regards, I am Sincerely, Frances J. Dewey (Mrs. Thomas E. Dewey)."

Wayside Gardens President Celebrates Fiftieth Year in Horticulture. Jan Jacobus Grullemans, President of Wayside Gardens, was born in Lisse, Holland, into "The House of Grullemans," a two-hundred-year-old Dutch family of bulb growers. Although he has been a part of horticulture since his birth, the actual gardening career of young Jan Grullemans began in 1904 when he went to England to gain experience in several of Britain's great nurseries.

He first visited the United States at the age of sixteen to sell tulips and other bulbs for his father's concern. In 1915, he married Evelyn Crosby, a Boston girl, and soon thereafter started Wayside Gardens at Mentor, Ohio, which he has developed into one of the finest nurseries in the country. It consists of over four hundred acres of choice farmland on which are grown flowering trees, evergreens, shrubs, perennials, roses, bulbs.

Although his son, several associates, and superintendents now handle many of the details of the vast nursery, "J. J.," as he is widely known, still has his hands full with the notable spring and fall catalogs, advertising, and sales. He travels anywhere new material may be available and conducts extensive tests before introducing new items to American gardens.

New Class of Roses. The All-America Rose Selections, Inc., has announced a new class of roses to be known as grandiflora. According to Sidney B. Hutton, President of this organization which represents the country's leading introducers and growers, the development of this new rose resulted

J. J. Grullemans

Grandiflora 'Queen Elizabeth'

from years of experiment and research.

The new grandiflora class combines characteristics of the hybrid tea and floribunda classes. The blooms feature the high-centered form and long stem of the hybrid tea and are borne in clusters in the manner of the floribunda. The plants are relatively tall, free-flowering, and the blooms are produced on stems long enough for effective use in flower arrangements.

'Queen Elizabeth' (Germain's, Cal.) one of the three roses to receive the All-America Rose Award for 1955, is a cross between hybrid tea 'Charlotte Armstrong' and floribunda 'Floradora.' It is a grandiflora, orchid-pink in color with glossy, deep green foliage. The other two winners are 'Jiminy Cricket' (Jackson & Perkins) a floribunda of coral-orange, and 'Tiffany' (Howards) a warm pink hybrid tea. The upright growth of 'Jiminy Cricket' makes it ideal for hedges, and its prolific blooming habit qualifies it as a fine choice for mass color effects.

Gift to Library. Dr. Elmer D. Merrill, formerly Director of the Arnold Arboretum and Director of The New York Botanical Garden from January 1930 to October 1935, has presented his very extensive library to The New York Botanical Garden. It contains some very rare volumes on taxonomic subjects. A more complete account of this valuable gift will appear in these columns after Miss Elizabeth C. Hall, Librarian of The New York Botanical Garden, has had the opportunity to unpack and assemble the books.

Accompanying Dr. Merrill's library were some of the medals which have been presented to him: among them the Carolus Linnaeus Medal awarded to him by the Linnaean Society in May 1939; the 150th Anniversary, 1792-1942, Medal of the Massachusetts Society for Promoting Agriculture, which was awarded to Dr. Merrill as eminent botanist and able administrator of Harvard University's botanical gardens; the George White Medal of Honor of the Massachusetts Horticultural Society, which was awarded to Dr. Merrill in 1946 for eminent services in horticulture; and several foreign medals.

John Henry Christ Herbarium Purchased by The New York Botanical Garden. The New York Botanical Garden has recently purchased the herbarium of John Henry Christ, of the U. S. Soil Conservation Service. The collection consists of some nineteen thousand mounted sheets, nearly all from Idaho, and includes the vast majority of species of vascular plants known to occur in that state.

Mr. Christ has botanized all parts of Idaho, and his carefully prepared specimens make up the best collection of Idaho plants in existence. His collection is the most important single acquisition of the herbarium of The New York Botanical Garden for a number of years. ARTHUR CRONQUIST

Herb Society of America. Members attending the twenty-first annual meeting of the Herb Society of America, held in New York City June 22, 23, 24, spent the second day at The New York Botanical Garden. The Garden cooperated with the New York Unit of the Herb Society in arranging the program for the day, which included annual business meeting and luncheon in the century-old Lorillard Snuff Mill. Dr. William J. Robbins, Director of The New York Botanical Garden was guest of honor. T. H. Everett, Horticulturist, gave a talk on "Unusual Herbs," and Dr. P. P. Pirone, Plant Pathologist, on "Insect Pests and Diseases of Mints."

Miss Elizabeth Hall, Librarian, arranged an exhibit, "Adventures of Herb Literature," which the members of the Herb Society of America viewed in the library of The New York Botanical Garden in the afternoon. They also inspected the nucleus of the herb herbarium, which is expected to be expanded under the direction of Dr. Richard Cowan.

Changes in Staff. As stated above in the notice of the annual meeting of the Board of Managers, A. C. Pfander, who has been Superintendent of Buildings and Grounds since 1943, was elected Administrator and Business Manager of The New York Botanical Garden. Mrs. Eileen Kene, who has been employed in the Accounting Department of the Garden for the past seventeen years, has been appointed assistant to Mr. Pfander, and Vincent Rampino, a construction engineer, has been appointed Acting Superintendent of Buildings and Grounds.

T. H. Everett has been appointed Curator of Education and Horticulturist of The New York Botanical Garden, and Howard Swift has been appointed Assistant to the Curator of Education and Horticulturist. A former student-gardener of The New York Botanical Garden, Mr. Swift has since been identified with W. Atlee Burpee Co., Podeska Balocchi, and Peter Henderson-Stumpp & Walter Co.

Reception for Graduates. As this issue of The Garden Journal goes to press, plans are being completed for a reception on Thursday evening, June 24, for the students who will be graduated from the Two-Year Science Course and the Two-Year Course in Practical Gardening given by The New York Botanical Garden. Dr. William J. Robbins, Director of the Garden, will present certificates in the Science Course to Mrs. Evelyn Ager, Mrs. Milton Goell, Mrs. Henry Imshaug, Mrs. Edward Tanenbaum, and Mrs. A. C. Werner; and in the Course in Practical Gardening to Mrs. Amelia Engel Ruben, Mrs. A. C. Werner, William Russell, and Mrs. Ida Fleischer. T. H. Everett, Curator of Education and Horticulturist, will deliver an address on "The Satisfaction of Gardening."

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Errata. Inadvertently, the line of credit was omitted at the bottom of Table 1, on page 67 of the May-June issue of The Garden Journal. Credit reads: "From New York State Flower Growers' Bulletin No. 39, November 1948."

In the article, "Artistic Plant Arrangement in Perennial Borders," the third sentence, first paragraph, second column, page 66 of the May-June issue should read: "The result can be thirty or more weeks of continuous glorious bloom according to the location, climate, selection."

BOOK REVIEWS **(from page 126)**

problems are encountered in this country and, even though some of our commonest diseases are not mentioned, the book will prove invaluable to the common gardener and to all persons advising on garden problems. The price is discouraging but when one considers that actually five excellent books are incorporated in one, and that almost every gardener will need information from each section, the price is not out of line with value received.

LOUISE T. DOSDALL
Asst. Prof. of Plant Pathology
University of Minnesota

LET THERE BE HERBS

A little girl, asked to define "disappointment," has been quoted as saying that it is the way plain vanilla extract tastes. If one nibbles the leaves of rose or lemon-scented geranium out of hand, he feels much the same about their flavor. However, the essence can be captured in food in several ways that will preserve the delicate appeal.

One of the most familiar ways is to place a leaf of rose geranium in the bottom of a cake tin before pouring in sponge batter, or in the bottom of a jelly glass to be filled with apple jelly.

Botanically, the scented geraniums are members of the genus *Pelargonium*. The New York Botanical Garden has one of the finest collections of these delightfully varied and fragrant plants. The lemony group includes several with variegated and crisply-curled leaves, which were floated in finger bowls in more leisurely days. A sprig of 'Prince Rupert' stuck in the bow of a boat of honeydews makes as pretty a pennant as can be imagined.

The plants themselves, whether they be the bright green velvet frosted with silver of the peppermint geranium or the soft rounded leaves of apple geranium lend interest to a porch or terrace, especially if they are set out in attractive pots or in a strawberry jar. If you put pelargoniums right into the garden, they attain such great size that it is difficult to repot them in the fall. Cuttings are made instead, using the old plant for dried leaves to add to pot-pourri. This is especially true of rose geranium. Where watering would become a problem during a vacation, the pots can be sunk in the earth up to their rims. This eases the move back to the house, also.

Rose Geranium Sugar

The pleasant savor and perfume of rose geranium can be transferred to sugar with which to dust cookies and cakes and to make icing for coffee cakes. Just as vanilla beans are placed in a jar of powdered or confectioner's sugar, the leaves of fruit or flower-scented pelargoniums can be used in the same way.

Lemon, nutmeg, and apple geranium may be done similarly. Half a dozen leaves to a four ounce jar of sugar is sufficient. Lump sugar stored with lemon geranium or garden spearmint will perk up a cup of tea. The possible combinations are endless — you can experiment for yourself.

Konstin

Many intriguing pelargonium and herb flavors may be added to this apple dessert made by putting two cups of apple juice over a low fire, adding two tablespoons sugar and two crushed rose geranium, lemon verbena or lemon geranium leaves. When the liquid comes to a boil, stir in four tablespoons corn starch which has been moistened with apple juice. Stir for two minutes, remove from fire and strain. Chill thoroughly before serving. Garnish with whipped cream flavored with rum and vanilla. — (Reprinted from *Cooking With an Accent* by Isabella Gaylord.)

Gertrude B. Foster

The Corporation of The New York Botanical Garden

The New York Botanical Garden was incorporated by a special act of the Legislature of the State of New York in 1891. The Act of Incorporation provides, among other things, for a self-perpetuating body of incorporators, who meet annually to elect members of the Board of Managers. They also elect new members of their own body, the present roster of which is given below.

The Advisory Council consists of 12 or more women who are elected by the Board. By custom, they are also elected to the Corporation. Officers are: Mrs. Hermann G. Place, Chairman; Mrs. James C. Mackenzie, First Vice-Chairman; Mrs. Guthrie Shaw, Second Vice-Chairman; Mrs. Barent Lefferts, Recording Secretary; Mrs. Antonie P. Voislawsky, Corresponding Secretary; and Mrs. John E. Parsons, Treasurer.

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Mrs. Arthur M. Anderson
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Mrs. Harold E. Anthony
George Arents, Jr.
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Dr. Raymond F. Bacon
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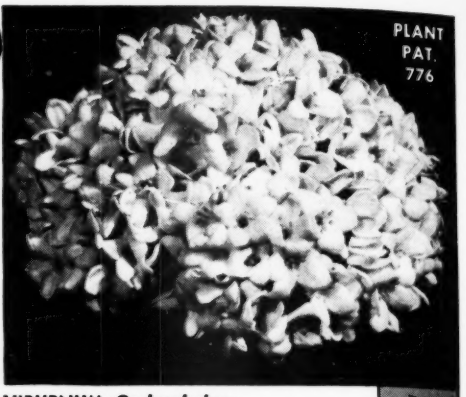

VIBURNUM, *Carlcephalum*
FRAGRANT SNOWBALL

WEATHER PROOF DAFFODIL
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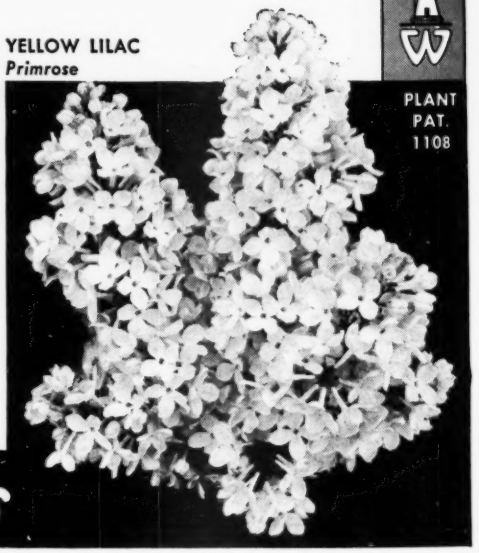
BLEEDING HEART, *Bountiful*



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